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ORCHARD REPLANT/INDUSTRY REVITALIZATION CONSULTATION

BACKGROUND PAPER 4

ECONOMIC ANALYSIS OF ORCHARD REPLANTING

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Preface

In September, 1999 the Minister of Agriculture and Food Corky Evans announced his intention to extend the orchard replant program for five years (\$25 million) and to establish a \$2 million industry development trust fund. Final approval of these funds was made contingent upon the industry developing a revitalization plan that will ensure the funds are used to the most effective and productive ends possible.

Consultations leading to the development of a revitalization plan are being led by a facilitator contracted by the Ministry of Agriculture and Food. To assist these consultations, four background papers have been prepared to provide up-to-date information regarding the tree fruit industry. These background papers are entitled *Production/Grower Profile*, *Packinghouse and Processing Profile*, *Marketing Profile* and *Economic Analysis of Orchard Replanting*.

Copies of these reports are available from the Ministry of Agriculture and Food and the Okanagan Valley Tree Fruit Authority.

Executive Summary

The report addresses issues in the economic analysis of B.C.'s orchard replant program. It is one of four reports that have been prepared as background material for upcoming consultations with the industry. The objectives of the report were to:

- identify existing reports and other documents that related to analysis of the replant programs and summarize their findings;
- identify additional available resources (databases, key informants etc.) that could provide additional information that would inform the consultations participants, and;
- identify areas in need of further research.

This section provides a summary of key points described in the full report.

OVFTA Replant program profile

The OVFTA orchard replant program has run from 1991 to 1999. During that time:

- Over 2,000 applications for replant projects were made
- \$15,249,733 has been paid in replant grants
- 5,190 acres have been replanted
 - Apples - 3,674 acres
 - Cherries - 826 acres
 - Peaches - 340 acres
 - Apricots - 158 acres
 - Pears - 76 acres
 - Nectarines - 73 acres
 - Plums - 43 acres
- Analysis of the OVFTA's data base reveals that between 1994 and 1999, 560¹ different producers participated in the replant program; given the 1996 OVFTA report of 1,108 producers² eligible for the grant, then over 50% of producers have participated in the program over that time period. The OVFTA newsletter³ reports over 800 producers or 72% have used the program between 1991 and 1999.
- Total amounts of producer investment in replanting are not directly available. However, in 1991, apple tree establishment costs per acre were estimated to be nearly \$10,000. Given that the replant grant stood at that time at a maximum of \$3,000 /acre then producers were investing up to \$7,000 per acre or 70%. In 1999 apple establishment costs are estimated at \$19,000 /acre and the replant grant at a maximum of \$4,200 /acre. To replant now, each producer is investing up to \$15,000 /acre or 78% of the total cost. Wherever a producer falls within this range, replant represents a serious financial commitment on the part of the producer even with access to the replant grant.

¹ Analysis of OVFTA database carried out for this report

² OVFTA Newsletter, 1996.

³ OVFTA Newsletter 1999

Transitional Production Adjustment Program (TPAP)

TPAP was introduced in 1993 to further assist growers in the financing of their replant projects by partially offsetting income loss in the first three years from replant with grant income. Through the OVFTA, the Ministry of Agriculture and Food plans to spend \$7.5 million on TPAP over the next three years, representing both a reinstatement of the program and coverage for eligible producers who planted after the program's termination in 1997.

Farm Credit Corporation - Plant Now -Pay Later Program

The Farm Credit Corporation provides tree fruit growers who replant an opportunity to receive a replant loan and to delay principle and interest payments for the first three years of the loan providing. This program provides further support for producers in the initial years of replant during which cash flow is not available from replanted acres. All producers are eligible for this grant.

Financial Capacity of Producers to Replant

A 1999 analysis of the financial position of the Okanagan tree fruit industry⁴ prepared for the Ministry of Agriculture and Food reports that:

- Most producers would lack the financial capacity to replant without access to the replant grant. The report could only identify 290 producers who could be reasonably expected to undertake an orchard replant if no replant and associated assistance programs were available;
- That virtually all producers would have the financial capacity to replant at the current value of the replant grant in combination with other programs such as the Farm Credit Corporation's Plant Now - Pay Later program.

It is noted that results for any grower will vary depending on individual choices of varieties, density of planting, management skills, orchard site characteristics, etc. and that the decision to replant will be influenced by a producer's outlook on the industry's future and willingness to bear risk.

The analysis also serves to underscore the critical link between the replant program and other farm safety net programs. Without other government assistance programs most producers would not have the capacity to acquire the loan and survive the years of no, or little, cash flow in the years from replanting until full production is reached.

The following table further demonstrates the critical role that the combined Replant and Farm Safety Net programs play in the ability of an operator to replant. The table is based on the assumption of a \$19,000 / acre establishment cost⁵. The approximate loan repayment costs are based on an interest rate of 7% and a 20-year term.

CONDITION	YR. 1	YR. 2	YR. 3	YR. 4	YEARS 5 - 20-
No replant grant	\$2,395	\$2,395	\$2,395	\$2,395	\$2,395
Replant grant	\$1,440	\$1,440	\$1,440	\$1,440	\$1,440
Replant Grant + FCC	\$0	\$0	\$0	\$1,890	\$1,890
Replant Grant + FCC +TPAP	\$0	\$0	\$0	\$1,510	\$1,510

⁴Lohr, W. (1999). Financial position of the Okanagan Tree Fruit Industry. Report to the B.C. Ministry of Agriculture and Food.

⁵ Ministry of Food and Agriculture (1999). Planning for Profit Agdex 211 810 Gala Apples Slender Spindle, 1,210 trees/acre. Okanagan Valley.

The Planning for Profit Agdex information sheet on establishment costs for Gala apples indicates a positive contribution margin from replanting of \$1,715 as of the third year. It is only under the condition of using the OVTFA replant grant, FCC Loan and TPAP that a producer could have a reasonable expectation of meeting his repayment costs from the contribution margin from a replanted acre in the year that the first loan payment becomes due. A contribution margin is defined as returns less variable costs.

Net benefits of Replanting

Reports that addressed issues of replant costs, returns and net benefits to producers were identified and summarized. Preliminary research was also initiated in order to identify if further benefits accrued to the orchard region and/or B.C. as a whole as a result of the orchard repealing programs. The following was established as a result.

Producer benefits

All identified reports between 1990 and 1999 that considered the costs, returns and net benefits associated with orchard replanting supported the conclusion of the 1990 Commission of Inquiry into the B.C. Tree Fruit Industry that the main approach for producers who wished to improve their returns is to renovate and diversify their orchard by replanting to newer varieties or strains and to do so at higher densities.

Further:

- The difference in contribution margins between B.C. and Washington producers was reduced when high-density plantings were used by B.C. producers.⁶
- At \$0.30 / lb. and \$3.00 /tree replant grant, 1200 to 2000 apple tree density plantings are estimated to be profitable by the fifth year from planting.
- A 1999 yield and price survey⁷ of B.C. established replanted blocks of new varieties had been successful when compared to maintaining existing blocks of Red Delicious or other traditional varieties
- The survey also established that higher density planting produced earlier yields and higher gross revenues than lower density block. However, there was wide variability in yields and gross revenues for all density ranges.

Regional Benefits

A number of expected regional benefits resulting from an extension of the replant program were identified in the report. These were based on identifying the benefits already accrued under the current replant program and on the continued need for revitalization of the industry through a continuation of the replant program for those benefits to be maintained or grow.

Expected regional benefits identified included:

- Continuation of direct cash flow benefits to the region
 - Over \$96 million in 1997 revenues
 - Nearly \$120 million spent each year on goods and services to support the industry
- Contribution to regional employment
 - The industry supports approximately 3,000 full time jobs
- Contribution to new investment in the region

⁶ Stennes, B. (1994). Apple cost of production at the farm level in British Columbia and Washington State. B.C. Ministry of Agriculture and Food.

⁷ OVTFA. (1999). Replanting for the future: Tree fruit yield and price survey

- The federal and provincial governments have contributed \$22 million to extend the Sterile Release Program
- An estimated \$3 to 3.5 million is invested in fruit research at the Pacific Agri-food Research Center in Summerland
- Fruit farms support the region's growing tourist industry in many ways

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1. Introduction

This report addresses issues in the economic analysis of B.C.'s orchard replant program. It is one of four reports that have been prepared as background material for upcoming consultations with the industry. The objectives of the report were to:

- identify existing reports and other documents that related to analysis of the replant programs and summarize their findings;
- identify additional available resources (databases, key informants etc.) to provide additional pertinent information for participants at the consultations, and;
- identify areas in need of further research.

This document provides the full report of the research project.

2. Methodology

This report has collected and analyzed data from a wide range of sources including previously published reports, databases, web sites, a survey and key informant interviews. A survey of producers, industry experts and packinghouse field persons was used to provide insight into producer approaches to varietal selection for orchard replanting. While much data was gathered and analyzed the project faced two major limitations. These were: 1) the very short timeframe in which to identify, gather and analyze the available information, and 2) the relatively limited amount of current data available in this area. However, despite these limitations, both known to the research team prior to their accepting the challenge, we believe that the report brings together all the key information that is currently available to the subject matter of the report.

3. Orchard Replant Program Profiles

3.1 Overview

A review of existing reports shows that from 1984 to the present time government programs designed to assist orchard replant and renovation have been implemented in the Okanagan Valley and elsewhere in B.C. Specifically, these projects were designed to provide an incentive to orchardists in B.C. to replant with improved varieties and/or root stocks at higher densities to increase returns per acre. Both the Agricultural Land Development Assistance Program (ALDA) and Canada-B.C. Subsidiary Agreement on Agri-Food Regional Development (ARDSA II) – 1985-90 have been utilized to assist orchard renovation and replant in the past. The present OVTFA Orchard Replant Program that was initiated in 1991 followed them. Over this period the level of assistance, number of acres replanted and density of replanting have all increased, as shown in Exhibits 4.1

This section provides a profile of the replant programs from 1984 to 1999.

Exhibit 3.1 Summary profile: All Programs: 1984 to 1999

PROGRAM	DURATION	LOCATION	NO. OF PROJECTS	TOTAL ACREAGE	COST OF ASSISTANCE
ALDA: Orchard Renovation	1984-91	Abbotsford, Summerland, Prince George, Oliver, Penticton, Vernon and Kelowna	91	Not available	\$0.9 million
ARDSA: Orchard Renovation Program I	1986	Oliver, Penticton, Vernon and Kelowna	306	716	\$1.2 million
ARDSA: Orchard Renovation Program II	1988-89	Oliver, Penticton, Vernon and Kelowna	105	305	\$1.1 million
OVTFA: Orchard Replant Program	1991-2000	Interior as defined by the OVTFA Act	850	5190	\$20.0 million

(Sources: Elaine Burgess MAF, November 4, 1999, BCMAF 1990-91 Annual Report and OVTFA database) Note: Figures for ARDSA and OVTFA acres replanted in 1991 are mixed and cannot be separated.

3.2 Previous BC orchard replant programs

3.2.1 Agricultural Land Development Assistance Program (ALDA)

Agricultural Land Development Assistance Program (ALDA)

ALDA was originally conceived in 1946 with the objective to improve the self-reliance of B.C. farms by providing low-interest loans to eligible farmers in B.C. for land-related, on-farm improvements which would enhance the productivity of their agricultural land base by increasing the volume or value of their product or reducing unit operating costs.

ALDA was aimed at providing both direct and indirect assistance designed to encourage permanent land development and the adoption of new technology. This program provided fixed-rate loans at one-half the bank prime rate, for eligible projects for up to \$75,000. The Orchard Renovation Program was designed to improve fruit quality and yields over the long term. Loan rates were the same as ALDA rates.⁸

⁸ BCMAF and OVTFA, Tree Fruit Consultation Forum, Assessment of the British Columbia Tree Fruit Sector, 1995.

Exhibit 3.2 ALDA Funding for Orchard Renovation, 1984/85 to 1990/91

YEAR	LOCATION	TOTAL CONTRACTS	TOTAL PRODUCERS	TOTAL LOANS
1984/85	Oliver, Vernon	2	2	15,235
1985/86	Not available	Not available	Not available	Not available
1986/87	Abbotsford, Oliver, Vernon, Duncan, Prince George, Kelowna, Summerland	23	17	148,133
1987/88	Penticton, Oliver, Vernon	23	18	231,467
1988/89	Abbotsford, Oliver, Chilliwack, Penticton, Kelowna, Vernon	11	10	110,828
1989/90	Oliver, Vernon	13	13	141,202
1990/91	Creston, Oliver, Duncan, Penticton, Kelowna, Vernon	19	18	221,524
TOTAL		91	78	868,389

(Source: Elaine Burgess MAF, November 4, 1999)

Grower Qualifications - ALDA

Farmers with eligible projects were provided with fixed rate loans (\$5,000/acre) at half the bank prime rate. ALDA Replant eligibility criteria changed over the years to harmonize with ARDSA. For example, applications were limited to farmers who had less than \$50,000 in off-farm income, but this restriction was later removed in 1990 to encourage more participation.

Exhibit 3.3 Evolution of ALDA Orchard Renovation Program Eligibility Criteria

PROGRAM	DETAILS
ALDA General 1986	<ul style="list-style-type: none"> • maximum loan of \$35,000 per farm operation • maximum non-farm income level of \$50,000 • land must be deeded, private leases were not acceptable
ALDA Replant 1986	<ul style="list-style-type: none"> • minimum 1 acre replant • minimum 200 trees per acre • no minimum operating orchard size • option of interest only 1st three years • no maximum on per acre capital costs
ALDA Replant 1987	<ul style="list-style-type: none"> • replant criteria harmonized to ARDSA Program • minimum replant of 300 trees per acre • no minimum operating orchard size • maximum loan size increased to \$50,000 per general ALDA Program • ALDA benefit limited to NPV of \$519 per acre if used in conjunction with ARDSA funding • no maximum on per acre capital costs

PROGRAM	DETAILS
ALDA Replant 1989	<ul style="list-style-type: none"> • replant criteria harmonized to ARDSA Program • minimum replant of 400 trees per acre • NPV calculation at \$519 • private leases accepted under the program • no maximum on per acre capital costs
ALDA Replant 1990	<ul style="list-style-type: none"> • replant criteria harmonized to ARDSA Program • minimum orchard size of 10 acres • replant on minimum 1 acre • minimum 400 trees per acre • maximum loan of \$75,000 • no maximum on per acre capital costs

(Source: Lorraine Saunders, ALDA Program, February 1992.)

Issues and Rationale - ALDA

- Fraser Valley & the Okanagan areas received the largest funding allocations from the ALDA projects.
- ALDA's shortcoming with regard to its rationale may have been its inability to clearly segregate between farmers who really needed financial assistance to implement projects and those who did not.

Outcomes/Results - ALDA

- Repayment schedule & term were rated highly by the farmers. Not only did the plan provide loan recipients with the flexibility to choose their annual repayment due date which coincided with their higher cash flow period, but also with a 15-year repayment term that eased financial burden for farmers.
- ALDA was moderately successful in generating greater sales revenues & reducing farmers unit operating costs (54% reported higher sales; 57% reported decreases in unit operating costs—20% of them "significant").

3.2.2 Canada-B.C. Subsidiary Agreement on Agri-Food Regional Development (ARDSA II) – 1985-90

On July 25, 1985 Canada and B.C. entered into ARDSA II which is a subsidiary agreement to the Economic and Regional Development Agreement (ERDA) of November, 1984. It was also an extension of the General Development Agreement (GDA) of 1974 between Canada and B.C.

The primary objectives of ARDSA II were to assist in:

- The growth and development of economic output from the agricultural sector of the B.C. economy;
- The increase of employment in the B.C. agri-food sector;
- The enhancement of the viability and competitiveness of the agri-food sector in B.C. to ensure the maintenance of employment and output; and

- The conservation and development of the agricultural resources necessary as inputs to an expanding agri-food sector.
- A major drawback to ALDA was that it had to take first place on the title. This put the program in a competitive position with bank mortgages and would have been a major obstacle if the program were used extensively.

ARDSA Orchard Renovation Programs I & II

In response to industry viability problems stemming from structural deficiencies, the ARDSA Orchard Renovation programs were intended to accelerate the rate at which orchardists replanted. Without a government incentive, it was felt that growers would continue renovating their orchards only as funds permitted.

Ultimately the project was delivered in two phases. In the initial phase, funding was approved for \$1.5 million. In June 1989 an additional \$1.5 million was approved to bring total project funding to \$3 million. A total of about 700,000 trees on 1,300 acres were replanted with the assistance of \$2.3 million in grants. This represents an average of \$1,800 per acre replanted, towards an average cost of renovation of \$8,800.⁹

Grower Qualifications - ARDSA Orchard Renovation Programs I & II

To qualify for a grant funding in the first phase of the project, orchardists were required to replant a minimum of one acre, with eligibility for funding to a maximum of three acres, or 15% of the orchard. The replant density was required to be at least 300 trees per acre. The applicant was required to own or lease a minimum of 10 acres of fruit trees, and in the case of leases, for a minimum period of 10 years. The level of funding to each orchardist was up to one-third of approved eligible costs to a maximum of \$2,000 an acre, subject to a limit of \$6,000 per applicant. A further \$2,000 per acre could also be borrowed from ALDA.

The capital cost per acre was estimated to be between \$7,500 and \$10,500 (average \$9,000) depending upon density. One-third of this cost would be \$2,500 to \$3,500 per acre, \$3,000 on average.

The second phase of the project was introduced in 1989 to increase the funding available to growers for orchard renovation, as a boost to further encourage even more replanting. The funding level per acre for apples was changed from \$2,000 an acre to \$1,500 an acre plus \$7.50 per tree, to a maximum of \$3,000 an acre. The maximum contribution to each applicant was increased to \$18,000. The requirements for density of planting for apples per acre was increased from 300 trees to 400 trees. The maximum number of acres qualifying for assistance was increased for all fruits from three to six acres. In the second phase of the orchard renovation project, plantings had to be inspected by May 15, 1991 to qualify for assistance.

Issues and Rationale - ARDSA Orchard Renovation Programs¹⁰

ARDSA was intended to accelerate the rate at which orchardists replanted. Without the government incentive, it was felt that growers would continue renovating their orchards only as funds permitted.

According to the Ministry of Agriculture and Food's Evaluation of ALDA in 1991, the project should perhaps have been more stringent from the outset in its requirements as to density and the capability of the eligible orchardists. This was reflected in the upgrading of the requirements in Phase II of the project.¹¹

⁹ Forum Consulting Group, MAF Evaluation of the Agricultural Land Development Assistance Program (ALDA), 1985-90, April 1991.

¹⁰ ibid

¹¹ ibid

Outcomes/Results - ARDSA Orchard Renovation Programs

- The ARDSA Orchard Renovation programs demonstrated that high density planting could work in the Okanagan.
- ARDSA's orchard renovation project was a useful incentive for action in the right direction, albeit a small contribution to a much larger need for renovation.

3.3 The OVTFA Orchard Replant Program

Okanagan Valley Tree Fruit Authority (OVTFA)

In 1990 the Okanagan Valley Tree Fruit Authority was established to assist with the revitalization of the tree fruit industry. The purpose of the OVTFA is to ensure an efficient and coordinated approach to the revitalization and transformation of the Interior tree fruit industry to ensure a strong, dynamic, and competitive tree fruit industry.

In addition, it is also the purpose of the OVTFA:

- to assist in the rehabilitation and improvement of orchard land and orchards
- to develop and operate programs to improve productivity of the tree fruit industry and the marketability of tree fruit
- to commission applied research into production and marketing
- to provide for the training of growers and farm workers
- to aid growers, packing houses, processors, and marketing enterprises by providing advice and other assistance

A major thrust of the OVTFA has been administrating a replant program to assist with replanting of older plantings with high-density plantings of new higher value varieties.

OVTFA Orchard Replant Program

Since 1991, the OVTFA has had the lead responsibility for the administration of cash grants covering a portion of the cost of replanting by Okanagan tree fruit farmers to new varieties. The replant grant program was developed to support the industry in making a switch more profitable product base.

It was estimated in 1995¹² that growers would invest \$50 million in replant projects over the 10-year mandate of the OVTFA. This figure was matched by an additional \$21 million by the OVTFA for a total of \$71 million. It was estimated this replanting would result in an increase in current industry farm gate revenues of \$50 million in 1995 to an estimated \$77 million by the end of the decade. When all of the replanted acreage comes into production, it was projected that the industry farm gate revenues would be \$85 million which represents an increase of over 90%.¹³ In the Ministry of Agriculture and Food's 1999 Report on the Financial Position of the Okanagan, Tree Fruit Industry, the latest report available, it is reported that fruit revenues for 1997 reached over \$96 million.¹⁴

¹² OVTFA brochure, 1995.

¹³ ibid

¹⁴ MAF, Financial Position of the Okanagan Tree Fruit Industry, July 1999.

Just over 800 growers applied for assistance¹⁵ to replant 5,190 acres to new varieties, as shown in Exhibit 3.4, over the 9-year program life. This is an annual average of 577 acres replanted.

Exhibit 3.4 B.C.'s Replanted Acreages by Commodity

YEAR	APPLES	PEARS	CERRIES	PEACHES	APRICOTS	NECTARINES	PLUMS	TOTAL ACRES
1991	587	12	28	27	25	17	3	699
1992	425	8	22	44	10	9	2	521
1993	337	3	47	18	15	6	0	425
1994	356	7	76	29	15	5	6	494
1995	322	16	46	36	22	7	6	454
1996	410	14	83	47	29	6	5	594
1997	533	10	196	43	25	8	11	825
1998	391	3	167	28	8	5	2	603
1999	313	4	161	68	10	10	9	575
TOTALS	3674	76	826	340	158	73	43	5190

Source: OVTFA database

Grower Qualifications - OVTFA Orchard Replant Program

Orchards needed to be at least 2.5 acres and owners and/or leases were required to maintain the operation for at least 10 years. In 1999, for apples, the grant was \$3/tree for a minimum of 600 trees/acre to a maximum of 1,400 trees/acre for maximum grant of \$4,200 per acre. For soft fruit and pears, the grant was \$750/acre plus \$3/tree to a maximum of \$3,000 per acre.

The Transitional Production Adjustment Program (TPAP)

The maximum grant per acre provided under the grant structure has varied from a low of \$3,000/acre in 1991 to a high of \$5,600/acre in 1997 before settling on the current rate of \$4,200/acre in 1998.

The Transitional Production Adjustment Program (TPAP) administered by the OVTFA was recently restored, making available transitional funding to bridge the time between removal of old, less-productive trees and the time when the new orchards bear marketable fruit. The original program, which was cut in 1997, helped growers respond to market and consumer demand for newer varieties. TPAP is a performance incentive program, applying horticultural checks to ensure basic tree growth, the health of trees and proper maintenance of the replanted orchard. Further information on TPAP is available in Section 6.5.1 of this report.

Issues - Orchard Replant Program¹⁶

- The success of the replanting is highly dependent on planting very marketable varieties and obtaining higher prices.
- There is a high risk associated with replanting. Excellent horticultural skills combined with the choice of a variety or commodity that will return sufficient revenue to repay the establishment costs in a reasonable timeframe are required.
- To encourage replanting of orchards to improve overall profitability there has to be continued support for tree fruit research.

¹⁵ OVTFA Newsletter, 1999.

¹⁶ OVTFA Replanting for the Future, Tree Fruit Yield and Price Survey, June 1999.

- Initial costs of replanting are high particularly with the higher densities and if the wrong variety is selected, then the replant project may not be economic.
- Care should be taken when analyzing cherries as price is dependent on the various marketing windows. Costs are also expected to be higher for cherries than apples

Outcomes/Results - Orchard Replant Program

- A major advantage being realized by the Orchard Replant Program is the labour efficiency associated with high density planting. The new high density growing systems have demonstrated efficiencies of labour with reduced pruning time expenditures being one example and no "ladder-work" for harvesting.¹⁷
- High density systems in B.C. have also enabled growers to learn to respond rapidly to changing conditions and thus capture more opportunities and reduce risk. These systems lend themselves to change. New varieties can be introduced by cutting off the tree and grafting new budwood onto the rootstock to change the variety of tree within a one to two year timeframe. This provides great flexibility.¹⁸
- Very high gross revenues per acre for cherries and Gala apples for some replant projects indicate the potential for profitability.

3.4 Replant Criteria in Other Jurisdictions

The research team was unable to identify any tree fruit replant programs similar in type and scope to those existing in British Columbia. We surveyed other provinces such as Ontario, Nova Scotia and Quebec and competing regions such as Washington State and New Zealand utilizing websites and personal interviews with agriculturalists. Some European countries may be funding pull-out programs but not replant programs¹⁹. This is an area requiring further study.

¹⁷ Hugh Philip, MAF, pers. comm.

¹⁸ Ross Husdon, OVTFA, pers. comm.

¹⁹ Jim Campbell, MAF, pers. comm.

4. Producer Approaches to Varietal Selection for Orchard Replanting

4.1 Approaches Used by B.C. Producers

A tree fruit variety selection method survey was developed. Twenty people consisting of producers (e.g., producers from the south and north producing a range of tree fruits), industry specialists and packinghouse field people were contacted to request completing the fax back survey. The results of the survey are summarized in the section below. The results of this informal survey, based on the small sample described here, can not be reliably generalized to the larger population of producers. However, the results do provide indications of selection factors used by operators. To gain a reliable understanding of this process further research is required.

A copy of the survey can be found in Appendix I.

Question 1 Factors considered in variety and tree fruit selection

Tree fruit producers currently consider a number of factors when selecting a variety or tree fruit for their orchard. Based on your own experience and knowledge, please check off one box below to indicate the level of consideration that you as a producer will typically give to each of the following factors when selecting a variety.

In most cases the producers chose either "always consider" or "sometimes consider" for the majority of the factors. This indicates that the survey identified the main factors producers used in making variety-related decisions.

In reference to the factor "Government programs (e.g. OVTFA replant program, WFIP, NISA, Crop Insurance, FCC)", four producers indicated they always considered this factor, two indicated sometimes considered and one never considered. However, this must be taken in the context that most of the factors as "always" or "sometimes" considered.

Question 2 The most commonly used factors

Using the list of factors in Question 1, please select the 5 top factors you as a producer consider when selecting a variety or tree fruit for your orchard. Write the number beside the factor listed in Question 1, ranking your selection from the top factor considered (enter a 1 beside the selected factor) to the lowest factor considered (enter a 5 beside the factor).

Producer

Five of the seven producers chose either future price potential or market considerations (e.g., Consumer demand for variety, market acceptability, demand and supply information) as their number one factor to consider when choosing variety.

The return per acre and market considerations (e.g., consumer demand for variety, market acceptability, demand and supply information) are the most highly considered factors for producers with those combined factors showing up 10 times out of the total of 35 choices.

All of the producers chose their top two considerations from these five factors.

- Site/orchard location (e.g., soil, slope, drainage)
- Climatic factors (e.g., frost free days, winter temperature)
- Future price potential

- Market considerations (e.g., Consumer demand for variety, market acceptability, demand and supply information)
- Rate of return per acre

Government programs (e.g. OVTFA replant program, WFIP, NISA, Crop Insurance, FCC) were only noted twice out of the total 35 factors identified.

Packinghouse Field People

Market considerations (e.g., Consumer demand for variety, market acceptability, demand and supply information) and rate of return per acre showed up in the top five of all packinghouse people. Other than the market and return observation there was not any consistency within the group or between the packinghouse and the producers.

Industry

Future price potential and market considerations (e.g., Consumer demand for variety, market acceptability, demand and supply information) were noted within the top three factors which was consistent with the producers and packinghouse rankings of those factors.

Overall, Question 2 revealed that based on this very preliminary survey the issues of future price potential, market consideration and rate of return per acres were some of the most highly considered factors for producers. Other factors did not appear to show any patterns or consistency within or between groups.

Additional research on this issue is required if reliable results generalizable to the overall producer population are to be obtained.

4.2 Approaches Used in Other Jurisdictions

Currently no information has been identified as available in this area.

5. Review of Reports on the Costs, Returns, and Net Benefits Related to B.C. Orchard Replanting

5.1 Overview

In his 1990 report, Lusztig²⁰ concluded that:

“the main avenue open to growers wishing to improve their operations and returns is the renovation and diversification of the their orchards by replanting to newer varieties or strains and at higher densities.” (p. 152).

Research for this report identified several reports completed since 1990 that have considered the costs and returns associated with orchard replant^{21,22,23,24}. All identified reports supported Lusztig's original conclusion. This section reports on the main conclusions of these reports as they relate to orchard replant costs, returns and net benefits.

5.2 1990 - Report of the Commission of inquiry¹

Based on extensive public hearings and the Commission's own research findings, Lusztig noted that it became clear that grower returns could be increased through improvements in the quality of fruit produced and diversification of apple varieties planted. However, also noted was the fact that selection and replacement of apple varieties is an inherently risky decision that must remain the responsibility of the grower.

The Commission's research concluded that even if a standard density Red Delicious block is at the peak of its production cycle, replanting to medium high density McIntosh, Gala or Jonagold would be more profitable providing the grower had the necessary horticultural and business management skills and was in a position to work an orchard of a reasonable size. The Commission's research results indicated the following Net Present Values associated with replanting from a 202 trees per acre of Red Delicious orchard to McIntosh, Gala and Jonagold over a range of tree densities per acre as shown in Exhibit 5.1.

Exhibit 5.1 Net Present Values associated with replanting from a 202 trees/acre Red Delicious orchard (in \$/acre).¹

VARIETY PLANTED	DENSITY					
	202	382	518	670	726	808
McIntosh	(5,030)	(1,500)	5,010	8,470	13,580	16,030
Gala	(6,280)	(2,000)	5,720	11,380	21,270	25,500
Jonagold	(2,800)	1,590	9,200	13,410	21,780	25,300

The report further noted that over and above the required rate-of return (or cost of financing) captured through the use of the Net Present Value approach, replanting a 20 acre farm with Gala or Jonagold, at 726 trees per acre, would contribute cash flows to the grower of \$420,000 in 1990 dollars. The Net Present

²⁰ Lusztig, P. (1990). Report of the Commission of Inquiry – British Columbia Tree Fruit Industry.

²¹ Stennes, B. (1994). Apple cost of production at the farm level in British Columbia and Washington State.

²² Husdon, R. (1999). OVFTA communication to the Ministry of Agriculture and Food

²³ Okanagan Valley Tree Fruit Authority. (1999). Replanting for the future: Tree fruit yield and price survey.

²⁴ B.C. Ministry of Agriculture and Food, (1999) Planning for Profit series. Agdex 212-810.

Values indicated in Exhibit 5.1 would be substantially larger if they had been compared to an older orchard of Red Delicious, with poorer packouts and lower yields.

The following assumptions related to the cash flows associated with the replanting were made in the Commission's analysis:

- 1) A 20 acre Central leader orchard with 202 mature trees per acre (including pollinizers) growing Red Delicious, yielding 32,000 pounds per acre and generating a cash flow of \$360 per acre
- 2) The renovated orchard was held to exist for 15 years
- 3) Cash inflows were recognized at year end
- 4) Net present values were computed using an 8 per cent real rate of interest
- 5) Prices received for each variety were assumed Fancy or better as one category and grades below Fancy as another.
- 6) The source for prices was the 1987 and 1988 apple pool close recap statements of a major B.C. packing house. Prices were averaged in 1988 dollars.

5.3 1994 Apple Cost of Production at the farm level in British Columbia and Washington State²

Stennes 1994 study estimated the costs and returns for apple production in the southern interior of British Columbia and Washington State. Average (5 year indexed to 1992 \$CND) price data, packouts of fresh fruit and yields/acre were used to develop farm-level returns. The estimated returns, variable costs, contribution margins, fixed costs and profit in each region were compared for a number of situations including same size, yield and variety mix and representative farms with typical sized and variety mixed and yield difference for the regions. The study only looked at market returns and did not consider the replant programs available to B.C. growers. The study established the following in relation to apple costs and returns and replanting with new varieties at varying densities:

- 1) Although contribution margins were higher for both low and high density plantings of Red Delicious in Washington than in the southern interior of B.C., the difference was reduced when high density plantings were used by B.C. producers. Contribution margins were found to be approximately 3 times higher in Washington for low density plantings but only 2.6 times higher for high density plantings. Profits ranged from negative \$1,426/acre to negative \$770/acre in B.C. versus (positive) \$160/acre to \$1,030/acre in Washington across the different farm sizes and densities. These results assumed the same yields in the two regions.
- 2) Including some Gala in the varietal mix (20% Gala at 771 trees/acre and 80% Red Delicious at 245.trees/acre) the relative economic performance of the B.C. farm improves greatly. On similar 25 acre farms, returns/acre averaged across the two varieties are \$5,300 in B.C. versus \$6,400 in Washington. This translated into a contribution margin of \$3,319/acre and profit of \$1,512/acre in B.C. versus \$4,562/acre contribution margin and \$2,830/acre profit in Washington.

5.4 1999 OVTFA orchard replant costs and returns⁴

The OVTFA provided a draft analysis of the costs and returns per acre for the OVTFA replant program (as it related to apples) to the Ministry of Agriculture and Food. The analysis, completed in spring, 1999, was based on data drawn from an OVTFA 1999 producer survey and discussions with industry experts. The analysis includes projected yields, incomes and costs, including the costs to establish a replanted acre. This data is provided for a range of tree densities and the calculations are based on the yields for Gala apples. The establishment costs, for planting in the 1,200 to 2,000 trees/acre range are \$19,000 to \$23,000 (excluding the replant grant).

The costs and returns are shown in Exhibit 5.2 through Exhibit 5.5 for a range of tree densities, replant grant levels and apple prices.

At the level of prices shown in Exhibit 5.2 (\$0.40/lb) all level of densities would be profitable by the sixth year (fifth year following the planting). The replant grant set at \$3.00/tree varies from \$4,000 to a maximum of \$5,100/acre depending on the tree density.

Exhibit 5.2 Costs and Returns per Acre – Replant Grant = \$3.00/tree, Apple price = \$.40/lb.

TREES/ACRE	ESTABLISHMENT COSTS	REPLANT GRANT %	TWO YEAR NET POSITION	SIX YEAR* RETURN/ACRE	SIX YEAR* NET POSITION	REPLANT GRANT/ACRE
<800	\$11,770	18%	-\$10,643	\$4,553	\$2,601	\$2,100
800 – 1200	\$15,115	20%	-\$13,547	\$6,239	\$1,328	\$3,000
1200 – 1500	\$19,018	21%	-\$15,935	\$10,697	\$17,252	\$4,050
1500 – 2000	\$22,920	22%	-\$16,923	\$13,706	\$26,818	\$5,100
>2000	\$31,840	16%	-\$26,507	\$13,819	\$14,034	\$5,100

*Five Years after planting.

The establishment costs and the level of the replant grant are the same for Exhibit 5.3 as for Exhibit 5.2. However, the price level is at \$0.30/lb resulting in only the 1,200 to 2,000 levels of tree densities showing profitability by the sixth year (fifth year of planting).

Exhibit 5.3 Costs and Returns per Acre – Replant Grant = \$3.00/tree, Apple price = \$0.30/lb.

TREES/ACRE	ESTABLISHMENT COSTS	REPLANT GRANT %	TWO YEAR NET POSITION	SIX YEAR* RETURN/ACRE	SIX YEAR* NET POSITION	REPLANT GRANT/ACRE
<800	\$11,770	18%	-\$10,893	\$2,953	-\$2,574	\$2,100
800 – 1200	\$15,115	20%	-\$13,797	\$4,139	-\$4,567	\$3,000
1200 – 1500	\$19,018	21%	-\$16,435	\$7,297	\$5,932	\$4,050
1500 – 2000	\$22,920	22%	-\$18,023	\$9,406	-\$11,738	\$5,100
>2000	\$31,840	16%	-\$29,307	\$9,319	-\$1,246	\$5,100

*Five Years after planting.

When the replant grant is set at \$4.00/tree (to a maximum of \$6,800/acre) and apple prices are at \$0.40/lb. then all level of tree/densities would be profitable by the sixth year (fifth year following planting) as shown in Exhibit 5.4

Exhibit 5.4 Costs and Returns per Acre – Replant Grant = \$4.00/tree, Apple price = \$0.40/lb.

TREES/ACRE	ESTABLISHMENT COSTS	REPLANT GRANT %	TWO YEAR NET POSITION	SIX YEAR* RETURN/ACRE	SIX YEAR* NET POSITION	REPLANT GRANT/ACRE
<800	\$11,770	24%	-\$9,873	\$4,553	\$3,371	\$2,800
800 – 1200	\$15,115	26%	-\$12,447	\$6,239	\$2,428	\$4,000
1200 – 1500	\$19,018	28%	-\$14,450	\$10,697	\$18,737	\$5,400
1500 – 2000	\$22,920	30%	-\$15,053	\$13,706	\$28,688	\$6,800
>2000	\$31,840	21%	-\$26,637	\$13,819	\$15,904	\$6,800

*Five Years after planting.

With the replant grant held at \$4.00/tree to a maximum of \$6,800/acre, but with a price drop to \$0.30/lb. only densities over the 1,200 trees/acre would be profitable by the sixth year (fifth year following planting) as shown in Exhibit 5.5.

Exhibit 5.5 Costs and Returns per Acre – Replant Grant = \$4.00/tree, Apple price = \$0.30/lb.

Trees/Acre	Establishment Costs	Replant Grant %	Two Year Net Position	Six Year* Return/Acre	Six Year* Net Position	Replant Grant/Acre
<800	\$11,770	24%	-\$10,123	\$2,953	-\$1,804	\$2,800
800 – 1200	\$15,115	26%	-\$12,697	\$4,139	-\$3,487	\$4,000
1200 – 1500	\$19,018	28%	-\$14,950	\$7,297	\$7,417	\$6,400
1500 – 2000	\$22,920	30%	-\$16,153	\$9,406	\$13,608	\$6,800
>2000	\$31,840	21%	-\$27,437	\$9,319	\$624	\$6,800

*Five Years after planting.

5.5 1999 OVTFA Replanting for the future: Tree Fruit Yield and Price Survey Report

From a survey of 125 growers (356 blocks that had been replanted between 1992 and 1995) who had useable data out of 185 growers who were sampled the following key conclusions were reported that supported Lusztig's 1990 conclusion.

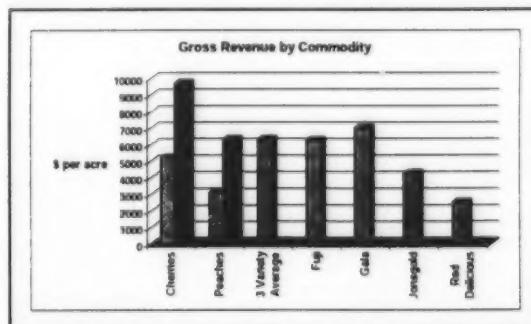
- Replanting to new varieties for most replant projects has been successful when compared to maintaining existing blocks of Red Delicious or other traditional varieties.
- Overall, highest gross revenues per acre for apples were reported with planting densities between 1,200 to 2,000 trees per acre.
- Higher density plantings produced earlier yields and higher gross revenues than lower density block.

The survey also indicates that:

- There is a wide variability in yields and gross revenues for all density ranges. The range of \$2,115 per acre average gross revenue in the fifth leaf for the bottom one third of the block and \$13,164 per acre for the top one third average indicates the wide variability in performance.
- There is high risk associated with replanting. Excellent horticultural skills combined with the choice of a variety or commodity that will return sufficient revenue to repay the establishment costs in reasonable timeframe are required.

The potential of replanting versus keeping existing plantings is shown in Exhibit 5.6. As shown in this exhibit, the average gross returns for all varieties selected exceeded the Red Delicious benchmark value.

Exhibit 5.6 Gross revenues by commodity identified in the OVTFA yield and price survey 1999



5.6 1999 Estimates for tree fruit establishment costs, income and contribution margins⁶

Exhibits 5.7 through 5.11 show 1999 estimates for establishment income, costs and contribution margins for Gala apples, pears, peaches, apricots, and sweet cherries prepared by the Ministry of Agriculture and Food in its Planning for Profit series.

For each tree fruit, sensitivity analyses have been carried out to estimate the impact of different scenarios on the contribution margin. For example, a price sensitivity analysis for Gala considers the effect of changing the price from the target of \$.0293 /lb. to both \$0.25 /lb. and #0.33 /lb. The production sensitivity analysis reports on the impact on the contribution margin of reduced yields of 10 and 20 percent below the target yield noted in the table. Finally, each table reports on the impact on the contribution margin of delaying production by one and two years.

As can be seen from the exhibits, under the specified densities and assuming yield, timing and price targets are met, Gala apples and peaches provide a positive contribution margin in year 3. Apricots and cherries in year 4 and Pears in year 6.

Examination of the data shown in these exhibits identified market return as the most significant variable affecting contribution margins in establishing an orchard. This observation emphasizes the importance for producers to obtain as much information on potential market returns when selecting a variety as is possible. The price obtained by a producer will vary with not only overall supply but also with quality, strain, variety and market channel.

Projected contribution margins also vary with yields obtained as indicated by the results of the sensitivity analysis when production is varied by a reduction of 20 and 10 per cent below the target yield. Similarly, contribution estimates are also affected by how soon the trees come into production as is indicated by the results of the sensitivity analyses when timing is delayed by one and two years. The variances in projected contribution margins resulting from not meeting target yields and timing show the importance of producers' skill level, graft quality, horticultural practices, location and the weather in profitable tree fruit production.

Exhibit 5.7 Gala apple establishment projected income and costs Slender spindle, 1999 with price, production and timing sensitivity analyses²⁵

Apples - Gala, Slender Spindle - 1210 trees/acre, Spring 1999

INCOME COSTS AND CONTRIBUTION MARGINS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
Yield (lb.) /acre)	0	6000	14400	23000	27000	30000	32000
Yield (lb./acre shipped)	0	5700	13300	21850	26560	28500	30400
Total Income (\$) (price = \$0.293/lb, Fc y + 91%)	0	1520	3546	5826	6839	7599	8105
Total costs (\$)	19263	2393	1831	2082	2253	2339	2637
Contribution Margin (\$)	(19263)	(873)	1715	3744	4586	5260	5468
<i>Price sensitivity:</i>							
Change to /acre contribution margins							
Price/lb. = \$0.25	(\$1097)	1194	2889	3583	4114	4279	
Price/lb. = \$0.33	(\$682)	2163	4480	5450	6219	6492	
<i>Production sensitivity: Change to /acre contribution margins</i>							
-20% (\$)	(\$1143)	1087	2712	3374	3913	4032	
-10% (\$)	(\$1008)	1401	3228	3980	4586	4750	
<i>Timing sensitivity:</i>							
Change to /acre							
Contribution margins							
2 Yr. Delay (\$)		(\$19263)	(873)	1715	3744	3744	4586
1 Yr. Delay (\$)		(\$19263)	(873)	1715	3744	4586	5260

Exhibit 5.8 Peach establishment costs, modified central leader: 1999 with price, production and timing sensitivity analyses²⁶

Peach - Modified Central Leader - 311 trees/acre Spring 1999

INCOME COSTS AND CONTRIBUTION MARGINS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Yield (lb/acre)	-	1,000	5,000	10,000	15,000	19,000	22,000	25,000
Total Income (\$) (price = \$0.35/lb, 90% marketable fruit)	-	315	1,575	3,150	4,725	5,985	6,930	7,875
Total Costs (\$)	6,410	1,073	1,470	1,920	2,546	2,920	3,271	3,584
Contribution Margin (\$)	\$6,410.00	\$758.00	\$105.00	\$1,230.00	\$2,179.00	\$3,065.00	\$3,659.00	\$4,291.00
Price Sensitivity: Change to/acre contribution margins								
Price/lb. = \$0.25		\$1345)	330	829	1,355	1,619	1,641	2,041
Price/lb. = \$0.39		\$285	1,590	2,719	3,749	4,451	5,191	
Production Sensitivity: Change to/acre contribution margins								
-20%		(2,310)	600	1,234	1,868	2,273	2,716	
-10%		(53)	915	1,706	2,467	2,966	3,503	
Timing Sensitivity: Change to/acre contribution margins								
2 Yr. Delay (\$)		\$1,073)	(758)	105	1,230	2,179	3,065	
1 Yr. Delay (\$)		\$758)	105	1,230	2,179	3,065	3,659	

²⁶ B.C. Ministry of Agriculture and Food, (1999) Planning for Profit series. Agdex 212-810. Peach - establishment. Modified Central Leader. B.C. Ministry of Agriculture and Food.

Exhibit 5.9 Apricot establishment costs, Central leader: 1999 with price, production and timing sensitivity analyses²⁷

Apricot - Central Leader - 150 trees/acre, Spring 1999

INCOME COSTS AND CONSTITUTION MARGINS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Yield (lb/acre)	-	2,500	6,000	11,000	13,500	15,000	15,000	15,000
Total Income (\$) (price = \$0.47/lb, 80% marketable fruit)	-	1,058	2,538	4,653	5,711	6,345	6,345	6,345
Total Costs (\$)	(4,925)	(682)	1,213	1,469	1,930	2,207	2,386	2,386
Contribution Margin (\$)	\$4,925	\$682	\$155	\$1,069	\$2,723	\$3,504	\$3,969	\$3,959
Price Sensitivity: Change to/acre contribution margins								
Price/lb. = \$0.30		\$538	151	1,040	1,438	1,664	1,664	1,664
Price/lb. = \$0.50		\$137	1,771	4,010	5,038	5,714	5,714	5,714
Production Sensitivity: Change to/acre contribution margins								
-20%	(187)	993	2,585	3,334	3,770	3,770	3,770	3,770
Timing Sensitivity: Change to/acre contribution margins								
2 Yr. Delay (\$)		\$682	(682)	(155)	1,069	2,723	3,504	3,504
1 Yr. Delay (\$)		\$682	(155)	1,069	2,723	3,504	3,959	3,959

²⁷ B.C. Ministry of Agriculture and Food, (1999) Planning for Profit series. Agdex 212-810. Apricot - establishment Central Leader. B.C. Ministry of Agriculture and Food.

Exhibit 5.10 Pear establishment costs, Central Axe: 1999 with price, production and timing sensitivity analyses²⁸

Pear - Central Axe - 389 trees/acre Spring 1999		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
INCOME COSTS AND CONTRIBUTION MARGINS										
Yield (lb/acre)				500	4,000	10,000	16,000	24,000	28,000	32,000
Total Income (\$) (price = \$0.20/lb, marketable fruit)	85%			85	680	1,700	2,730	4,080	4,760	5,440
Total Costs (\$)		(7,451)	(1,020)	1,323	1,649	1,655	1,822	2,037	2,129	2,224
Contribution Margin (\$)		\$ (7,451)	\$ (1,020)	\$ (1,238)	\$ (969)	\$ (45)	\$ 898	\$ 2,043	\$ 2,631	\$ 3,216
Price Sensitivity: Change to/acre contribution margins										
Price/lb. = \$0.15				\$ (1,259)	(1,139)	(380)	218	1,023	1,441	1,856
Price/lb. = \$0.25				\$ (1,216)	(799)	470	1,578	3,063	3,821	4,576
Production Sensitivity: Change to/acre contribution margins										
-20%				(1,155)	(1,105)	(295)	354	1,227	1,679	2,128
Timing Sensitivity: Change to/acre contribution margins										
2 Yr. Delay (\$)				\$ (7,451)	(1,020)	(1,238)	(969)	45	898	2,043
1 Yr. Delay (\$)				\$ (1,020)	(1,238)	(969)	45	898	2,043	2,631

²⁸ B.C. Ministry of Agriculture and Food, (1999) Planning for Profit series. Agdex 212-810. Pear – establishment Central Axe. B.C. Ministry of Agriculture and Food.

Exhibit 5.11 Sweet Cherry establishment costs, 1999 with price, production and timing sensitivity analyses²⁹

Sweet Cherry - Spring 1999

INCOME COSTS AND CONSTITUTION MARGINS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
Yield (lb/tree)	0	0	2.5	7	18	28	32
Yield (lb/acre)	-	-	1,500	4,000	10,500	16,000	18,500
Total Income (\$)	-	-	1,530	4,080	10,710	16,320	18,870
price = \$1.20/lb, 85% marketable fruit)							
Total Costs (\$)	8,941	1,182	2,061	2,670	4,798	6,150	6,792
Contribution Margin (\$)	\$8,941)	\$1,182)	\$531)	\$1,410	\$5,912	\$10,170	\$12,078
Price Sensitivity: Change to/acre contribution margins							
Price/lb. = \$1.00			(786)	730	4,127	7,450	8,933
Price/lb. = \$1.30			(404)	1,750	6,804	11,530	13,650
Production Sensitivity: Change to/acre contribution margins							
-20%			(837)	594	3,770	6,906	8,304
Timing Sensitivity: Change to/acre contribution margins							
2 Yr. Delay (\$)			\$1,182)	(1,182)	(531)	1,410	5,912
1 Yr. Delay (\$)			\$1,182)	(531)	1,410	5,912	10,170

²⁹ B.C. Ministry of Agriculture and Food, (1999) Planning for Profit series. Agdex 212-810. Sweet Cherry – establishment. B.C. Ministry of Agriculture and Food.

5.7 Distribution of Replant Benefits Among the Producer Population

This section considers the distribution of replant benefits among producers. Data for this section has been drawn from an analysis of the OVTFA replant program data base and the OVTFA Newsletter. The grant data for 1991 was identified from the Forum Consulting ARDA database.

Exhibit 5.12 shows that there were 2,267 applications for a replant grant between 1991 and 1999. Over that period \$15,249,733 was paid to those producers in replant grants. The exhibit also shows that over the same time period those producers replanted 5,190 acres of fruit trees. This is placed in the context of OVTFA's report that there were 1108 growers eligible for the replant grant in 1996.³⁰ Analysis of the OVFTA database identifies 560 different producers who participated in replanting projects between the years 1994-1999 (identification for the number of producers from the early years was not possible). Given OVTFA's identification of 1108 eligible growers, the data indicates that 50.5% of the eligible producers took advantage of the replant grant between the years 1994 and 1999.

The OVTFA Newsletter identifies 800 producers as having replants grants from 1991 to 1999. Thus for the entire period over 70% of eligible produces have participated in the program.

Exhibit 5.12 Number of replant grant applicants by year (1991 – 1999).

YEAR	# OF APPLICATIONS FOR REPLANT GRANTS (1991 – 1999)	TOTAL # OF ACRES REPLANTED
1991	298	699
1992	214	521
1993	226	425
1994	236	494
1995	232	454
1996	278	594
1997	321	825
1998	250	603
1999	212	575
Total	2,267	5,190

Exhibit 5.13and Exhibit 5.14 show the distribution of those benefits received in replant grants across different tree fruits and the number of acres replanted as a result. Exhibit 5.15 shows the number of replant projects by type of tree fruit.

Exhibit 5.13 Replant grants (\$) 1992 – 1999) by tree fruit

YEAR	APPLES	PEARS	CERRIES	PEACHES	APRICOTS	NECTARINES	PLUMS	TOTAL(YR.)
1992	1220200	19070	62358	111261	23652	23999	5662	1466202
1993	1212334	7994	133687	47899	33954	17221	0	1453089
1994	1290867	19204	220108	78867	40859	14260	14541	1678706
1995	1158597	4996	142636	108095	60336	21486	19238	1515384
1996	1443014	43287	250611	134288	83320	17197	14662	1986379

³⁰ OVFTA Newsletter. (1996). The B.C. Tree Fruit Industry – A Look at the Numbers.

YEAR	APPLES	PEARS	CERRIES	PEACHES	APRICOTS	NECTARINES	PLUMS	TOTAL(YR.)
1997	2180203	25148	428570	87208	50068	15281	21398	2807876
1998	1254004	4545	305830	47848	14412	8404	2818	1637861
1999	1038831	7364	341655	119619	19380	18304	16849	1562002
Total	10798050	131608	1885455	735085	325981	136152	95168	14107499

Exhibit 5.14 Number of acres replanted under OVTFA program; (1991 -1992)

YEAR	APPLES	PEARS	CERRIES	PEACHES	APRICOTS	NECTARINES	PLUMS	TOTAL ACRES
1991	587	12	28	27	25	17	3	699
1992	425	8	22	44	10	9	2	521
1993	337	3	47	18	15	6	0	425
1994	356	7	76	29	15	5	6	494
1995	322	16	46	36	22	7	6	454
1996	410	14	83	47	29	6	5	594
1997	533	10	196	43	25	8	11	825
1998	391	3	167	28	8	5	2	603
1999	313	4	161	68	10	10	9	575
Total	3674	76	826	340	158	73	43	5190

Exhibit 5.15 Number of replant projects by commodity (1991 - 1999)

COMMODITY	1991	1992	1993	1994	1995	1996	1997	1998	1999	TOTAL
Apples	260	178	187	190	175	210	242	191	141	1774
Apricots	36	16	10	15	26	32	30	12	14	191
Cherries	24	7	18	26	26	36	69	62	55	323
Nectarines	28	12	8	7	12	13	11	7	13	111
Peaches	29	42	21	27	33	42	40	26	49	309
Pears	14	5	3	6	10	9	8	3	4	62
Plums	12	5	0	9	9	9	8	4	10	66
Total	403	265	247	280	291	351	408	305	286	2836

6. Characteristics and Estimate of Numbers of Producers Financially Capable of Replant

6.1 Overview

A 1999 analysis of the financial position of Okanagan tree fruit operators' capacity to finance orchard replant³¹ concluded that the majority of tree fruit producers require government financial support if they are to replant their orchards. This is the only study identified that has been carried out to estimate the financial capacity of operators to replant their orchards. The analysis, prepared for the Ministry of Agriculture and Food, showed that operators had experienced financial declines in measures of their income but that most had experience an increase in their Net Worth over the period 1991 to 1997. Both net operating and taxable income at the individual Okanagan fruit farm operator level has decreased during this period. Off-farm income has also decreased over the same period for all operators except for those in the \$50,000 to \$99,000 revenue class who had experienced an increase in off-farm income. It is noted that Net Worth has increased for all fruit farm operators except those in the \$10,000 to \$24,999 revenue class. The analysis revealed that from 1991 to 1997 there was a decrease of 16.3% in fruit farm operators with short-term debt but an off-setting 18.3% increase in fruit farm operators with long-term debt.

Insufficient working capital was noted as a major obstacle to growers in their efforts to undertake an orchard replant. The analysis concluded that the reasons for the farms working capital deficit could include:

- 1) That operating revenues were less than operating expenses for a period of time resulting in increased current liabilities and /or depleted cash reserves; and
- 2) Growers made capital purchases, including replant, out of current revenues rather than using term financing.

The Net Worth of the fruit farms in the Okanagan region was calculated to be nearly the equivalent to the value of the land and buildings. In excess of 80% of the value of total farm assets is derived from the value of land and buildings. Current assets and machinery and equipment assets were found to account for a relatively small component of the total assets or of net worth. The vast majority of the "asset base" of the tree fruit industry was shown to lie with the land base used in the production process.

In the absence of programs such as Replant, TPAP and FCC, the financial capacity of the Okanagan tree fruit industry to finance orchard replant is constrained by the availability of operating revenues and particularly net operating revenues. The net operating revenues available, particularly to those farm operators generating under \$100,000 of farm cash receipts was reported as generally not adequate to service existing debt levels, living costs, and provide for any allowance for replacement of depreciable assets including replacement of existing orchards.

6.2 Without Government Assistance

The 1999 analysis of the financial position of the Okanagan tree fruit industry concluded that only those farmers with gross farm receipts greater than \$100,000 would be in a likely position to be able to undertake orchard replant without government support initiatives. This, the analysis concluded, meant there would be 290 operators in the Okanagan Region who would be likely able to undertake replant.

³¹ Lohr, W. (1999). Financial Position of the Okanagan Tree Fruit Industry. Ministry of Agriculture and Food.

It is noted that the assumption of \$9,865 per acre replant cost used in the financial capacity analysis appears low when compared to other recently available estimates that range from \$19,000³² to \$23,000³³ per acre (excluding replant grants) for high density apple replanting. Taking this into consideration it can be assumed that the estimates of those operators with the capacity to undertake a replant without government assistance represents the maximum number and in fact, could be even smaller. Data reviewed from a draft report on the economic impact and establishment cost of replanting³⁴ shows that the range of establishment costs encountered are likely accounted for by the varying densities at which producers replant. The report supports studies that indicate replacement costs of \$19,500/acre at a density of 1452 trees/acre.

6.3 With Current Level of Assistance Provided by the OVTFA

The 1999 analysis of the financial position of tree fruit producers in the Okanagan region concluded that current replant and specialized loan programs would provide virtually all producers in that region the opportunity to replant if they so chose.

The analysis was based on 1997 revenues and assumed an OVTFA grant of \$4,000 per acre and replant costs of \$9,865 per acre and access to the Farm Credit Corporation's Plant Now, Pay Later for financing program the remaining \$5,865 per acre replant cost. As noted in Section 6.5.1, the FCC program permits deferment a three-year deferment of interest on replant costs and a 20 year loan term. A 7% interest rate was assumed for the analysis.

6.4 Relationship of the replant program to other assistance programs

Overall, equity is not a significant issue as the majority of the tree fruit operators have high equity levels. The issue is, as noted in the analysis of the financial position of tree fruit producers in the Okanagan, that operating revenues do not provide adequate returns to service existing debt levels, living costs and leave any allowance for replacement of depreciable capital assets, including the orchards. Thus the importance of producers not only having access to the replant grant itself but also to other programs, such as the FCC loan program, in order that the producers may carry themselves through the years on negative or marginal returns prior to the replanted orchards coming into full production. Exhibit 6.1 further demonstrates the critical role that the combined Replant and Farm Safety Net programs play in the ability of an operator to replant. The exhibit is based on the assumption of a \$19,000 / acre establishment cost³⁵. The loan repayments are based on an interest rate of 7% and a 20 year term.

Exhibit 6.1 Approximate annual replant loan payments and years of payment commencement under varying levels of government support

CONDITION	YR. 1	YR. 2	YR. 3	YR. 4	YEARS 5 - 20-
No replant grant	\$2,395	\$2,395	\$2,395	\$2,395	\$2,395
Replant grant	\$1,440	\$1,440	\$1,440	\$1,440	\$1,440
Replant Grant + FCC	0	0	0	\$1,890	\$1,890
Replant Grant + FCC + TPAP	0	0	0	\$1,510	\$1,510

³² B.C. Ministry of Agriculture and Food, (1999). Planning for Profit series. Agdex 212-810. Gala Apples – establishment. Slender spindle.

³³ Husdon, R. (1999). OVFTA communication to the Ministry of Agriculture and Food

³⁴ Ellison, C. (1999). Economic Impact & Establishment Costs of Replanting (Draft). BC Ministry of Agriculture & Food.

³⁵ Ministry of Food and Agriculture (1999). Planning for Profit Agdex 211 810 Gala Apples Slender Spindle, 1,210 trees/acre. Okanagan Valley.

The Planning for Profit Agdex information sheet on establishment costs for Gala apples indicates a positive contribution margin from replanting of \$1,715 as of the third year. It is only under the condition of using the OVTFA replant grant, FCC Loan and TPAP that a producer could have a reasonable expectation of meeting the loan repayment costs from the contribution margin from a replanted acre in the year that the first loan payment becomes due.

However, it is noted that the decision to replant or not, and the opportunity to benefit from it, does not rest just on financial capacity alone. Other key factors such as the operators' willingness to embrace change/risk, level of horticultural and management skills and outlook on the industry can play key roles in an individual operator's decision to replant or not.

A description of government assistance programs and Farm Safety Net programs is found in the following section.

6.5 Government Assistance For Replant and Farm Safety Net Programs

Since the early 1970's, the federal government and the provincial government have supported the B.C. tree fruit industry through a variety of programs designed to stabilize prices and grower income. Lusztig, 1990, reported that between 1974 and 1989, the B.C. tree fruit industry received approximately \$350 million in financial assistance and about \$95 million in research and extension programs.³⁶

The support to apples in B.C., over the period 1989-92 tended to be above the Canada average, and annual support was at least as high as in other provinces. During 1986-88 the B.C. apple industry was the only one among the provinces receiving direct provincial assistance. The bulk of the support to all B.C. tree fruits (including apples) was through direct payments. In comparison, other provinces emphasized general sector assistance, such as credit programs and fuel tax rebates.

The following sections provide a brief summary of present government assistance programs and Safety Net programs that support growers to replant plantings with improved varieties and/or root stocks at higher densities to increase production and returns per acre.

6.5.1 Replant Related Programs

Okanagan Valley Tree Fruit Authority (OVTFA) Orchard Replant Program

Since 1991, the OVTFA Orchard Replant Program³⁷ funded by the Ministry of Agriculture and Food has assisted tree fruit growers to replant 5,190 acres. The program costs approximately \$2 million annually and is scheduled to end in the year 2000. The proposed extension of the Replant Program for another five years would cost government \$25 million based on replanting 1,000 acres per year. The estimated cost is based on continuing replant grants at their current levels. This program is profiled in more detail in Section 3 of this report.

Farm Credit Corporation: Plant Now-Pay Late Loan

The FCC Plant Now - Pay Later Loan helps growers to renovate or expand fruit operations. This loan was developed to assist farmers to better manage cash flow in the transitional years before the replant investment sees any returns. The loan offers flexible terms and conditions to match production cycles and an amortization period that matches the life cycle of the replanted orchard. The FCC Plant Now - Pay Later Loan allows a grower to defer payments for up to three years and finance costs of site preparation, planting and maintenance. Two payment choices are available: (1) deferring principal and interest

³⁶ Lusztig, P. (1990). Report of the Commission of Inquiry - British Columbia Tree Fruit Industry.

³⁷ Ministry of Agriculture and Food, Communications Branch, October 26 1999.

payments during the first three growing seasons, including the replant year or (2) the grower can choose an additional two years of interest-only payments, making interest-only payments for the first five seasons. Eligibility is limited to tree fruit farmers who are renovating or expanding production of apples, pears and tender fruit trees including peaches, nectarines, apricots, cherries and plums.³⁸ There are no statutory limits on who may apply for the loan.³⁹

The Transitional Production Adjustment Program (TPAP)

A cornerstone of the revitalization programs offered by the OVTFA has been its Replant Program, which provides grants to help offset the capital costs of establishing a new orchard. It has been recognized, however, that when a productive block has been removed there is a loss of cash income during the early years until the new block begins to yield some revenue. The Transitional Production Adjustment Program (TPAP) was introduced in 1993 to further assist growers in the financing of their replant projects by partially offsetting this income loss with grant revenue in the first three years following replanting.

The TPAP program has been an important supplement to the OVTFA Replant Grant and was designed to encourage growers to respond to market and consumer demand for newer varieties. TPAP also provides assistance when planting high density orchards to bare ground, where programs like NISA do not apply.⁴⁰ Throughout its lifetime TPAP has been administered by the OVTFA.

To qualify for ongoing TPAP grants a grower must first successfully complete a project under the OVTFA Replant program. Application may then be made in the first, second and third anniversary years for TPAP funds. The projects are subject to continuing inspection and must satisfy performance criteria before payment is made.

With reductions in funding to the OVTFA in late 1996, the TPAP program for 1997 and subsequent years was terminated. At that time the OVTFA expected to have some funds available from retained earnings to provide a one time gratuitous payment to growers who would have otherwise qualified for payment under TPAP for 1994, 1995 and 1996 plantings.⁴¹ This "Special Transitional Payment" was made in the fall of 1997.

The Ministry of Agriculture and Food is planning to spend \$7.5 million on TPAP over the next three years. This commitment supports forward-looking farmers who made long-term business decisions to invest in the industry through replanting based on the expectation that the transition program would continue. The OVTFA expects to pay nearly \$3 million to just over 600 growers who are eligible to receive payments as a result of the provincial government's recent decision to reinstate funding for TPAP. The average payment to growers is estimated to be \$4,718.⁴²

Exhibit 6.2 Schedule of Grants Expected under the Reinstatement Payment

YEAR OF PLANTING	PAYOUT
1994	\$500/acre ¹
1995	\$625/acre ¹
1996	\$1,125/acre ¹
1997	\$1,750/acre ²
1998	\$1,000/acre ³

Notes: 1. Based on 50% of the remaining eligible payment.. 2. Covers the first and second year payments to operators who replanted in 1997.
3. Covers the first year payment for replanting done in 1998.

³⁸ FCC website: <http://www.fcc-sca.ca/english/ProductsServices/LoanProducts/plantnow.html>

³⁹ John Fredette, FCC, pers. comm.

⁴⁰ Hudson, R. OVTFA. (1999), pers. comm.

⁴¹ Hudson, R. (1997), Letter to Growers. OVTFA

⁴² OVTFA. (199), New Release

Fertigation and Soil Grants

Prior to 1997 the Ministry of Agriculture and Food provided growers with fertigation and soil grants of up to \$3.75 million. These optional supplementary grants were administered by the OVTFA and growers could apply for these kinds of assistance when applying for the replant grant. These programs were terminated at the end of 1996 due to reductions in funding mentioned earlier in this report.

Supplementary grants providing up to \$500 per acre were available to those installing low volume irrigation systems and fertigation equipment in conjunction with their replant projects.

A supplementary grant of \$250 per acre was provided to encourage soil testing and fumigation against replant disease.

Loan Guarantees

Four million dollars in farm operating loan guarantees have been made available by the Ministry of Agriculture and Food to help farmers in the Okanagan and Creston areas. The loan guarantee program is offered through most chartered banks and credit unions and through the Farm Credit Corporation (FCC). Loans (to a maximum of \$100,000) can be used to refinance outstanding operating debts and to pay for fertilizer, pesticides, fuel and repairs.

Sterile Insect Release (SIR) Program

With the federal government, \$4 million has been placed in trust for the Sterile Insect Release (SIR) Program to protect orchards by eradicating codling moths and eventually eliminating the need for insecticides. The program has sharply reduced the need for pesticides on fruit trees in the South Okanagan, the Similkameen and Creston regions since it began in the early 1990s. It uses cutting-edge technology to release millions of sterile codling moths in these fruit producing areas. The sterile moths mate with fertile moths, the resulting eggs do not develop and over time the population is eradicated.⁴³

The federal and provincial governments each provided \$7.85 million for capital costs and the OVTFA provides additional operating costs. Overall funding to date has been approximately \$22 million. The \$3-4 million annual cost to operate the Program is shared through taxes on both local growers and property owners. Therefore SIR benefits the tree fruit industry and replant helps fulfill the SIR program requirement for a stable acreage base to support the program. The technologies associated with the SIR Program may be exportable with present interest coming from Syria, South Africa and Washington State.⁴⁴

Tree Fruit Industry Development Trust Fund

The establishment of a \$2 million BCMAF Tree Fruit Industry Development Trust Fund will be explored in upcoming consultations with the industry to ensure that industry and government's investment results in a viable, market-focused, self-reliant industry. The fund will help industry undertake research to develop the necessary market focus and technical skills required to support a revitalized industry.

⁴³ Agriculture and Agri-Food Canada, News Release: Governments of Canada and B.C. Boost Funding For Sterile Insect Release Program, December 1997.

⁴⁴ Adrian McCluskey, SIR, pers. comm.

6.5.2 Government Assistance Through Safety Net Programs

Net Income Stabilization Account (NISA)

NISA is designed to help producers invest some of their income in good years, which they can later draw upon when needed. Eligible farmers may deposit up to three per cent of their eligible net sales into a personal NISA account and receive matching contributions from the federal and provincial governments.

Recent changes to the Net Income Stabilization Account (NISA) triggering criteria have enabled tree fruit growers to have easier access to \$18.7 million (\$8.6 million of provincial and federal funds and \$10.1 million put aside by tree fruit farmers themselves) in NISA accounts which can be drawn upon in hard times. To date, for the 1998 stabilization year, there are 1,340 tree fruit growers participating in the NISA program with an average fund balance of \$13,987. In 1998, there are 1,090 participants with funds available for withdrawal. The total fund available for withdrawal is \$11.3 million and the average funds available for withdrawal is \$10,330.⁴⁵

Trends in withdrawals as a percentage of funds available is as shown in Exhibit 6.3:

Exhibit 6.3 Trends in NISA Withdrawals for Tree Fruit Industry

STABILIZATION YEAR	NUMBER OF PARTICIPANTS	NUMBER OF PARTICIPANTS WHO TRIGGERED A WITHDRAWAL	AVERAGE FUNDS AVAILABLE FOR WITHDRAWAL	WITHDRAWALS AS A % OF FUNDS AVAILABLE
1998*	1,340	1,090	\$10,330	23.14%
1997	1,386	810	\$9,236	30.265
1996	1,247	669	\$7,237	16.40%
1995	1,320	731	\$5,798	19.54%

Notes: Changes to minimum income trigger in 1998 increased the number of participants eligible to make a withdrawal. Minimum income trigger was raised to \$20,000 from \$10,000 for individuals and \$35,000 from \$20,000 for corporations. Data for the 1998 stabilization year is only for those participants with forms processed as of September 17, 1999.

Crop Insurance

The Canada-B.C. crop insurance program provides protection against loss of a crop due to specific natural perils. Payments from crop insurance are included in revenue calculations under the whole farm insurance program.

More than 80% of the tree fruit industry takes advantage of the "Basic" policy which guarantees 60% of the average yield at 80% of the market price, as well as protection for tree survival and hail and rain coverage. "Plus" coverage allows producers to increase their coverage to a maximum of 80% of normal yields and 100% of market value, reducing the deductible for tree damage or increasing hail and rain coverage.

\$3.86 million have been added to the Canada/B.C. Crop Insurance Program to cover rain and hail losses for the 1999 crop year and reduce "Plus" premiums for 2000. In 1998, \$14 million in crop insurance was paid out to tree fruit growers for 1997 crop year losses (\$4 million of the \$14 million was deferred to 1998). The major issue is the timing of reporting this income for tax purposes and how it impacts the calculation of reference margins and the 70% support level for WFIP. Growers who deferred 1997 crop insurance payments into 1998 will have the crop insurance indemnities included in their 1998 tax statements. In other words, how tree fruit growers file their tax will affect the calculation of their reference margin for the WFIP program).

⁴⁵ NISA Administration report, September 24, 1999.

A complete review of the program by Ference Weicker in June 1998⁴⁶ resulted in changes to provide better protection for tree fruit growers. Changes include:

- Equalization of basic coverage for all tree fruit crops;
- Elimination of deductibles; and
- Simplifying the policy.

Whole Farm Insurance Program (WFIP)

Started as a two-year pilot program in 1998, the WFIP has been extended for one year to cover the 1999 crop with a \$6.8 million provincial contribution. In B.C., the two-year federal AIDA program is administered through the province's Whole Farm Insurance program. So far this year under the WFIP, the B.C. government has paid more than \$11 million to 568 farmers across the province to cover dramatic farm income losses in 1998. Last year, the province paid more than \$10 million to some 550 B.C. farmers hard hit in 1997. WFIP is calculated on a full year's farm income. B.C. farmers' access to federal funds means farmers can receive up to \$145,000 through the combined AIDA and WFIP programs for unexpected farm income losses this year.⁴⁷

The WFIP protects farmers from unexpected and unusual drops in overall farm income due to weather or market price changes. Farmers are able to calculate their entire agriculture losses for the tax year at the same time as they calculate their income tax returns for the year.

The province earlier made a number of changes to the Whole Farm Insurance Program (WFIP), which the Agricultural Income Disaster Assistance (AIDA) is modeled after, at the request of industry leaders and with the approval of the B.C. agriculture safety net advisory committee.

Some of these changes follow:

- An adjustment has been made to the way farmers report the value of apple and pear inventories, which will increase the amount of disaster funding farmers can receive. Inventories in the packinghouses are now considered receivables for the purposes of the program. This was done to more accurately reflect the true nature of the farm loss in the claim year and in many cases increased growers' claim. In 1998, the WFIP paid out \$2 million to tree fruit growers for 1997 farm-income losses;
- Growers whose claims do not result in disaster funding will be refunded the \$100 claim application fee;
- Application forms have been simplified;
- The deadline for applications was extended to July 31, 1999 to allow more farmers to apply;
- Workshops have been set up to help growers fill out claim forms; and
- The cap on the total claim has been increased by 45% to \$145,000.

For the entire province, 1,015 WFIP/AIDA claims have been received and 834 claims have been processed. The number of claims paid is 630 with the total value of payments at \$13,116,967. To date, the average claim payment is \$20,820. Of these claims 669 have been tree fruit claims. 565 of the tree fruit claims have been processed and 429 have been paid. The total value of the tree fruit claims is \$6,428,382 and the average payment per claim is \$14,985.⁴⁸

⁴⁶ Weicker, F. (1998). Review of Canada-B.C. Crop Insurance Program.

⁴⁷ MAF, News Release, Province Extends Whole Farm Insurance Program, September 1999.

⁴⁸ AAFC Summary of AIDA/NISA Statistics - 1998 Stabilization Year, October 14, 1999.

To date, 386 tree fruit growers have received \$5.6 million under WFIP for 1998 income losses, and at least another \$1.4 million in claims are being processed.⁴⁹ The Government of Canada recently announced that it is adding \$170 million to the two-year Agricultural Income Disaster Assistance (AIDA) program, which raises federal emergency assistance to farmers above \$1 billion. Changes are also being made in the eligibility and coverage aspects of the AIDA program so that a good portion of farmers' eligible negative margins will be covered for both years of the program, 1998 and 1999.

⁴⁹ Ministry of Agriculture and Food, Communications Branch, October 26 1999.

7. Operator Demographics for Future Programs & their Implication for Future Program

7.1 Overview

An operator's financial capacity to undertake an orchard replant is a fundamental factor in any decision an operator will make on this issue. However, it is unlikely to be the only factor to be considered in the decision making process. For example, an operator's age has been noted in some report as another likely additional factor that may influence an operator's decision to replant. This section provides an overview of that which is known of B.C. tree fruit operator demographics and notes any implications they may have for future replant programs. The data is drawn from the 1996 Agricultural Census of Statistics Canada.

Exhibit 7.1 Number and percentage of tree fruit operators by age group (1996)

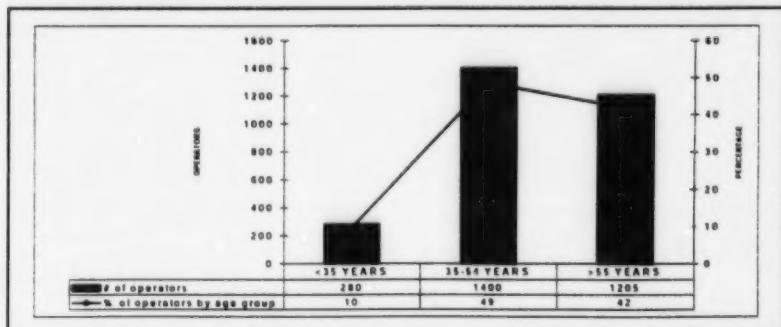


Exhibit 7.1 shows that the majority of producers (49%) are in the 35 to 54 age group but that an almost equal number (42%) fall in the over 55 age group. Less than 10% of producers fall in the under 35 category.

Exhibit 7.2 shows the average age in each age group.

Exhibit 7.2 Average age within tree fruit producer groups (1996)

NUMBER OF YEARS	AVERAGE AGE IN GROUP
<35	28.8
35-54	44.6
>55	63.5

Exhibit 7.3 shows the number of acres farmed in tree fruits by each age group and the percentage that that acreage represents of the total tree fruit acreage. One half the acreage was farmed by the 35 to 54 year old age group, one third by the over 55s and less than 15% by the youngest group.

Exhibit 7.4 shows the number of producers reporting apple production and Exhibit 7.5, the number of acres in apple production.

Exhibit 7.3 Acres in tree fruits by producer age group (1996). Number of acres and percentage

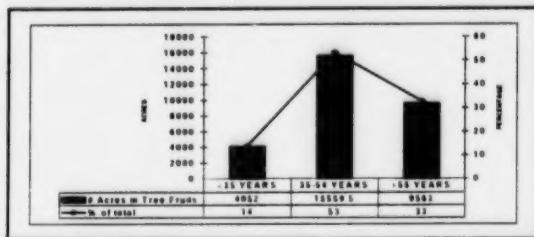


Exhibit 7.4 Number of producers reporting apple production by age group (1996)

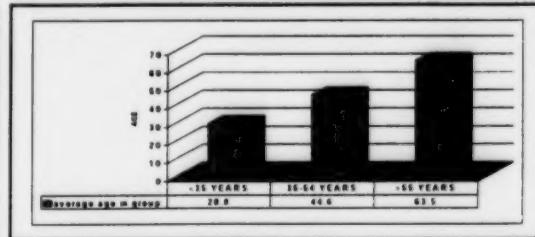
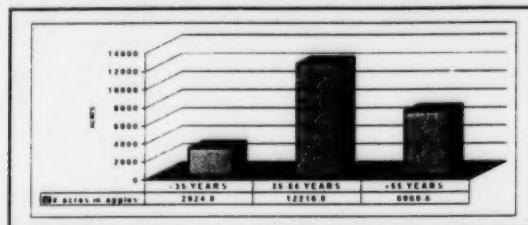


Exhibit 7.5 Number of acres in apple production by producer age group (1996)



The average number of apple trees per acre by producer age group is shown in Exhibit 7.6. On average, the highest density orchards will most likely be found in the 35-54 year old age group.

Exhibit 7.7 shows the total number of non-bearing apple trees by age group and Exhibit 7.8 the number of non-bearing trees is expressed as percentage of the total number of apple trees within each age group. As might be expected, the younger group have a larger percentage of their trees in the non-bearing category (26%) compared to the other two age groups (15% each). Interestingly, there is very little difference in proportion of non-bearing trees in the two older age groups.

Exhibit 7.7 Total Number of Non-Bearing Trees by Age Group

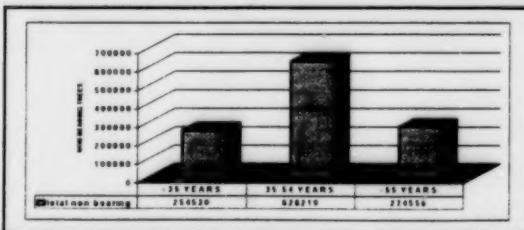


Exhibit 7.6 Average Density of Apple Trees/Acre by Producer Age Group (1996)

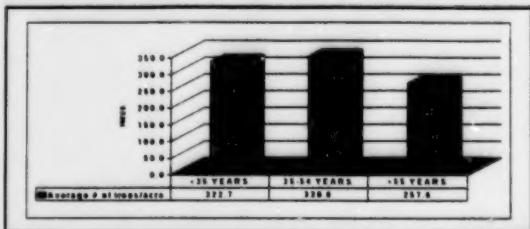


Exhibit 7.8 Non-Bearing Apple Trees as a Percentage of Total

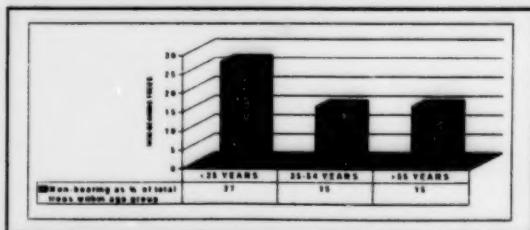


Exhibit 7.9 Percentage of total number of producers reporting non-bearing apple trees by age group

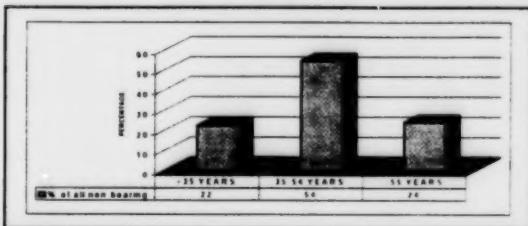
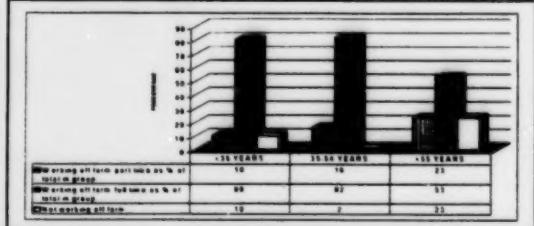


Exhibit 7.10 Percentage of Producers Working Off-Farm – Full-Time & Part-Time



However, even though younger producers are more likely to have non-bearing trees than the other two age groups, they have, due to the much lower number of producers in that age group, only a small proportion of the total number of non-bearing apple trees. Exhibit 7.9 shows the younger group to have only 22% of the total number of non-bearing trees.

Exhibit 7.10 shows the percentage of producers who reported working off the farm full and part time in 1995 and not working off the farm at all by age group. Considerably fewer operators worked off the farm full time in the senior age group compared to the other two age groups.

Exhibit 7.11 shows the average years of schooling by producer age group. This indicates that the average number of years of schooling is starting to decline in the younger group compared to the 35 to 54 year age group.

Exhibit 7.12 shows the size of farms held by producers in different age groups and Exhibit 7.13 shows the percentage holding those acreages within each age group. As can be seen from the Exhibit, nearly 60% of the younger farmers work farms of 10 to 69.9 acres. Farmers are less likely to fall in this category from the other age groups, who tend to have smaller acreages.

Exhibit 7.12 Size of farm by producer age group (1996)

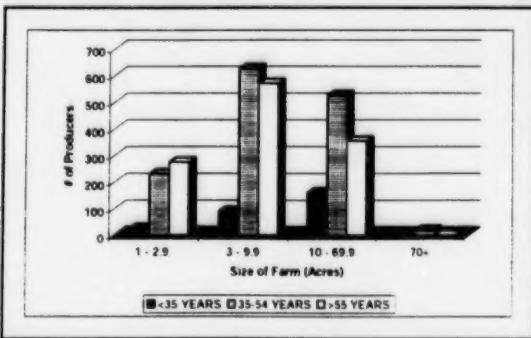
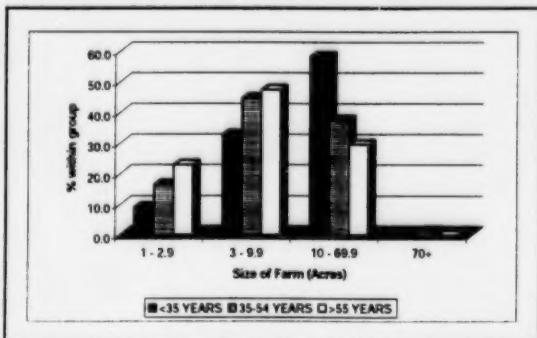


Exhibit 7.13 Percentage within age groups of number of acres held



Finally, Exhibit 7.14 shows the gross farm receipts by producer age group and Exhibit 7.15 shows the percentage receiving those receipts within age groups.

Exhibit 7.14 Gross farm receipts by age group

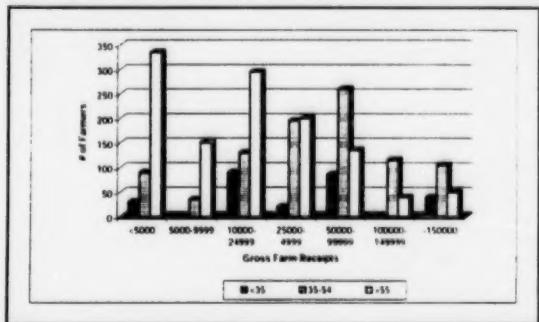
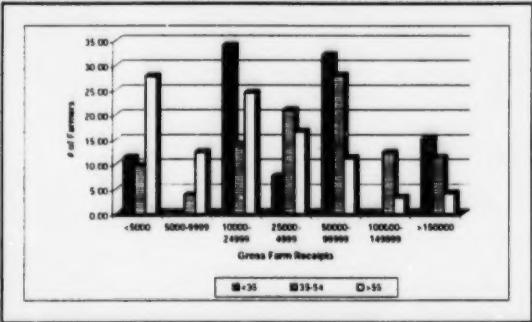


Exhibit 7.15 Percentage within age groups of gross farm receipts



7.2 Implication of demographics for future programs

Some documents reviewed for this report have assumed that older operators will be less likely to replant than their younger counterparts. However, the data shown above shows that it can not be assumed with any certainty that operators in the over 55 age group will not consider replanting. Operators under 35 years old have been more likely to replant than those operators in the two older age groups given the proportion of non-bearing trees they report (26%). However, the over 55 age group had proportionately just as many non-bearing trees as did the 35-54 year age group in 1996 (approximately 15% each). This is an important observation for any future replant program given that the over 55 age group farm one third of the total tree fruit acreage in B.C.

8. Characteristics of a Self-Sustaining Replanted Orchard

In order for an orchard to be self-sustaining, growers without off-farm income must generate sufficient net operating income to provide adequate cash-flow to cover living costs, debt retirement, and either cash or debt-repayment capacity for capital purchases including orchard replant. Other growers can supplement income from off-farm sources. Results for a specific grower in achieving a self-sustaining replanted orchard will vary depending on individual choices of varieties, density of planting, management, factors related to physical location of orchard including soil and microclimate, and the quality of fruit produced.⁵⁰ Farms reaching projected targets for viability generally have a larger appropriate mix of apple varieties, younger average age of plantings, above average packout percentages and some diversification such as nursery sales or custom work for others.⁵¹

The following sections describe characteristics that are considered to be important factors in establishment of a self-sustaining replanted orchard. These characteristics are (1) size of farm, (2) location of farm, (3) density of planting, (4) age of producer, (5) required skills, and (6) links to market research and market channels and (7) links to variety research. Bulleted comments then summarize source material for each factor.

8.1 Size of farm

The following factors relating to farm size should be considered in the establishment of a self-sustaining replanted orchard:

- In B.C. the middle acreage size orchards (15 -30 acres) have shown the best overall performance.
- Size of farm may be an important consideration in terms of ability to cash flow replant programs.⁵² Both Stennes⁵³ and Ellison⁵⁴ reported that the middle acreage size orchards (15 -30 acres) in B.C. have shown the best performance, with a combination of market returns and safety nets and/or other farm income generally covering all costs. All income sources (fruit sales, safety net and other program payments, interest and other farm income) were generally needed by the other acreage groups to cover all costs.⁵⁵
- Typical orchard size in B.C. is smaller than in Washington State, being close to 10 acres versus 50 acres respectively, and farm size accounts for at least half of the unit cost difference between B.C. and Washington State.⁵⁶
- Larger farms enable the grower to employ economies of scale to utilize the same range of equipment and storage facilities required by smaller farms.
- Fixed costs on a 10 acre B.C. orchard are more than \$600 per acre higher than on a larger 50 acre B.C. orchard. Most of the cost differences are machinery and equipment costs.⁵⁷

⁵⁰ Financial Position of the Okanagan Tree Fruit Industry, July 1999.

⁵¹ ibid

⁵² Jim Cambell, MAF, pers. comm.

⁵³ The Economics of Apple Production at the Farm-Level in British Columbia and Washington State, September 1994.

⁵⁴ Financial Data Survey, Okanagan Valley Tree Fruit Producers, January 1995.

⁵⁵ ibid

⁵⁶ ibid

⁵⁷ ibid

- Farms of sufficient size allow diversification of varieties which, in turn, allow the grower to spread risk over a number of varieties. Larger holdings also lend themselves to rotation of new plantings, thereby helping to reduce the extreme highs & lows in earnings.
- Due to constraints of the physical geography, there are few areas in the Okanagan region where the large, American-style farms are even possible. The Washington State model does not work in the Okanagan. The ideal tree fruit farm size in B.C. may be more in the 20 acre realm.⁵⁸
- Larger orchard operations are more likely to be capable of affording full time managers devoted to the intensive management that density plantings require.
- Consistency of quality may be more easily achieved when there are fewer, larger farms or intensively managed smaller farms.
- Quality control and consistent quality are key issues among individual growers and across the industry. Quality consistency may be difficult to achieve in places like B.C. where there are a high number of people producing one variety of apple (e.g., red delicious).⁵⁹
- Smaller farms in B.C. are well suited to high density plantings (where growers might pick 2 or 3 times) and ensure production of high quality tree fruit of the right variety.⁶⁰
- Leasing of orchards, being encouraged by the OVTFA, may assist some growers to compensate for their own smaller holdings.⁶¹

8.2 Location of Farm

The physical location of an orchard, its soils and microclimate, and the farm's physical relation to supporting facilities such as water delivery systems, packing houses and processing facilities are clearly important considerations in establishment of a self-sustaining replanted orchard. The following factors relating to farm location should be considered:

Soils and microclimate of the farm.

- By virtue of their unique microclimates, some locations lend themselves to production of later maturing tree fruits, such as cherries, for one example. Utilization of these locations to target later than average production of tree fruits may lend themselves to market opportunities but may also involve higher risk.⁶²
- The combination of topography, soil conditions and microclimates throughout the Okanagan is such that the region is extremely well suited for tree fruit production.^{63,64}

The farm's relation to transportation routes and other tourist facilities.

- A variety of farmers in the Okanagan region are demonstrating that agri-tourism can be good for the bottom line. Agri-tourism and other multi-purpose activities are dependent on location⁶⁵ and are probably not utilized as fully as they could be.⁶⁶ Farmers can add value by bringing tourists onto the farm to educate them. Some orchards are becoming very successful in tying tourism with

⁵⁸ Gambell P. Past Director, OVFTA, pers. comm.

⁵⁹ D. O'Rourke, Director, IMPACT, Washington State USA.

⁶⁰ Ross Husdon, OVTFA, pers. comm.

⁶¹ ibid

⁶² ibid

⁶³ Gambell P. Past Director, OVFTA, pers. comm.

⁶⁴ Ross Husdon, OVTFA, pers. comm.

⁶⁵ ibid

⁶⁶ ibid

agriculture.⁶⁷ There are now several examples of expanding shops, tour bus parking and local gift shops. Tourism associations routinely field requests from tour operators for u-pick orchards. In response, some growers are replanting to softer varieties to ensure a longer season.⁶⁸

8.3 Density of planting

The following factors relating to replant density are key in considering the establishment of a self-sustaining replanted orchard:

- Density is but one factor of several affecting returns in the self-sustaining replanted orchard. Significant gains in net returns can be achieved through production of varieties favoured by consumers, higher densities, improved quality, and better marketing.
- The trend toward higher density planting continues today. In 1999 the OVTFA reported that replanting to new varieties for most replant projects has been successful when compared to maintaining existing blocks of Red Delicious or other traditional varieties. They noted that higher density plantings produced earlier yields and higher gross revenues than lower density blocks.⁶⁹
- High density systems in B.C. have enabled growers to learn to respond rapidly to changing conditions and thus capture more opportunities and reduce risk. The new high density growing⁷⁰ systems have also demonstrated efficiencies of labour, e.g. reduced pruning time expenditures.
- In 1990 the Luszttig inquiry reported that the main avenue open to growers wishing to improve their operations and returns was the renovation and diversification of their orchards by replanting to newer varieties or strains at higher densities.⁷¹
- Five years later the Tree Fruit Consultation Forum⁷² reported that there could be possible advantages of higher densities and inclusion of higher-valued varieties in the production mix.
- Replanting to the density levels now being supported by the OVTFA Orchard Replant Program (1200-1400 trees/acre) seem to have the acceptance of a majority of the growers within the B.C. tree fruit industry⁷³ and can be more profitable than lesser densities when combined with good horticultural skills to ensure early production.⁷⁴
- Overall, highest gross revenues per acre for apples have been reported with planting densities between 1,200 - 2,000 trees per acre.⁷⁵ Returns are affected by variety mix and orchard density, through price, yields and costs. For Red Delicious apples, higher densities provide higher gross returns and higher returns over variable costs, than do lower densities.⁷⁶
- High density systems in B.C. have also enabled growers to learn to respond rapidly to changing conditions and thus capture more opportunities and reduce risk. These systems lend themselves to change. New varieties can be introduced by cutting off the tree and grafting new budwood onto the rootstock to change the variety of tree within a one to two year timeframe. This provides great flexibility.⁷⁷

⁶⁷ Robert Fine, Kelowna Economic Development Commission, pers. com.

⁶⁸ Linda Trudeau, Thompson Okanagan Tourism Association, pers. com.

⁶⁹ OVTFA, Replanting for the Future, Tree Fruit Yield and Price Survey, June 1999.

⁷⁰ Hugh Philip, MAF, pers. comm.

⁷¹ Report of the Commission of Inquiry - British Columbia Tree Fruit Industry, May 1990.

⁷² Tree Fruit Consultation Forum, Assessment of the British Columbia Tree Fruit Sector, 1995.

⁷³ Gambell P. Past Director, OVTFA, pers. comm.

⁷⁴ OVTFA, Replanting for the Future, Tree Fruit Yield and Price Survey, June 1999.

⁷⁵ ibid

⁷⁶ Stennes, 1994.

⁷⁷ Ross Husdon, OVTFA, pers. comm.

- An additional benefit of higher density plantings is the associated reduction of environmental, health and safety risks as the overall volume of pesticides is reduced. Reduced use of pesticides generally produces a positive response in tourists⁷⁸ and agri-tourism initiatives can benefit from the new physical structures associated with higher density plantings. Smaller, more easily accessible and visible trees also harmonize with agri-tourists' desire to see growers demonstrate production skills and to pick fruit.
- Anecdotal information implies that the health and safety of orchard workers has increased with the adoption of higher density plantings. The safety coordinator of the Farm and Ranch Safety and Health Association (FARSHA) notes that over 50% of the injuries in orchards come from falls from ladders or elevations. Accidents are definitely lower with the move to step stools in higher density plantings. FARSHA hopes for a 20% decrease in falls from ladders and elevations with the advent of higher density plantings.⁷⁹
- Due to the physical structure (i.e. reduced tree volume) of replanted orchards, higher density plantings can minimize use of harsh, more toxic chemicals in favour of smaller, better targeted, amounts of softer products that allow natural biologicals to occur. As chemical costs rise, this reduction in the use of pesticides and related products can produce a substantial cost savings.⁸⁰

8.4 Producer Age

Each producer age category may be associated with its own set of relative strengths and weaknesses in so far as establishing a self-sustaining replanted orchard is concerned.

Generally speaking, the family owned business may have a wealth of knowledge and contacts in the tree fruit industry which are very important. These are often brought in by the older generation while the new management and production techniques are brought in by the younger people in the family business.⁸¹ This mix of contacts and general industry knowledge with expertise in the newer management and production techniques is of high value in establishing a self-sustaining replanted orchard.

8.5 Required Skills

Keen horticultural and business management skills are a key requirement in establishment of the self-sustaining replanted orchard.

- In 1990 the Report of the Commission of Inquiry stated "Growers possessing the necessary horticultural and business management skills and in a position to work orchards of reasonable size, should be strongly encouraged to adopt higher density plantings that are diversified in terms of varieties."⁸²
- A Washington State authority states that switching to new varieties is not always the only viable possibility. He underscores the importance of the grower finding out what he or she can do best and building better returns from those particular activities.⁸³ As the Forum Report states, it is important to concentrate on strengths, including a range of varieties and fruit types, some better quality fruit, smaller scale with better management, etc.⁸⁴

⁷⁸ Robert Fine, Kelowna Economic Development Commission, pers. comm.

⁷⁹ Sandeep Mangat, Farm and Ranch Safety and Health Association, pers. comm.

⁸⁰ Hugh Philip, MAF, pers. comm.

⁸¹ D. O'Rourke, Director, IMPACT, Washington State USA.

⁸² Report of the Commission of Inquiry - British Columbia Tree Fruit Industry, May 1990.

⁸³ D. O'Rourke, Director, IMPACT, Washington State USA.

⁸⁴ Tree Fruit Consultation Forum, Assessment of the British Columbia Tree Fruit Sector, 1995.

- Enhanced horticultural management and education assistance is needed to ensure success in high density management. Some growers do extremely well while others are not as successful. Steps need to be taken to assist growers and their advisors to improve their replant knowledge because improved grower skills will help increase the success of replant projects.⁸⁵
- Managing a replanted high density orchard is a learning process. Growers need to develop a thorough strategic plan and cultivate the ability to respond quickly to changing conditions in order to reduce risk. Good horticultural skills are critical for bringing high density plantings into early production.⁸⁶
- The Commission of Inquiry suggested the completion of a set of appropriate extension courses, including those with a business management focus offered by the Ministry of Agriculture and Food, a course of studies taken at a college, a university degree in agriculture, or some reasonable equivalent as the basis for establishing grower competence.⁸⁷
- A great number of growers have embraced the new high density technologies but some are not getting the production levels they thought they would. Technology transfer and horticultural training are extremely important.

8.6 Market Research

The following have been noted as important for a self-sustaining orchardist to consider in relation to market research:

- The lead in time nurseries need to make stocks available, the decision making process B.C. nurseries use in determining what stocks will be made available and the links to nurseries in the U.S.
- Preparation of a market development strategy that includes an assessment of new varieties and commodities. The implications of fruit quality within the marketing mix must be considered as well.⁸⁸

8.7 Variety Research

The 1999 OVTFA Tree Fruit Yield and Price Survey states that "Since the replanting program is so dependent on planting marketable varieties, the industry should develop an overall industry plan for assessing new variety introduction and pass that information to growers. Growers can then make informed decisions based on that information."⁸⁹

The following factors are important to consider in developing an overall plan:

- Evaluation of growing and production practices, as well as variety research, is important and in many ways a present strength. On going research is critical to solving the technical problems that always occur in the tree fruit industry.⁹⁰ A self-sustaining orchardist must have access to the results of the evaluations.

⁸⁵ ibid

⁸⁶ Jim Campbell, MAF, pers. comm.

⁸⁷ Report of the Commission of Inquiry - British Columbia Tree Fruit Industry, May 1990.

⁸⁸ OVTFA, Replanting for the Future, Tree Fruit Yield and Price Survey, June 1999.

⁸⁹ ibid

⁹⁰ Jim Campbell, MAF, pers. comm.

9. Expected Benefits Of Extension Of The Replant Program

The Okanagan tree fruit industry is composed of three major components: farm operations, packinghouses, and processing. These three components, together with associated supporting initiatives such as the Okanagan-Kootenay Sterile Insect Release (SIR) Program at Osoyoos and the Pacific Agri Food Research Centre (PARC) at Summerland, and participation of the industry in ancillary sectors such as tourism, make a significant contribution towards the overall impact that the industry has on the socio-economic well-being of the region and province. However, as a review of studies for this report shows, the continued capacity of the sector to contribute to the regional and provincial economy and social infrastructure is dependent on its continued revitalization through continuation of orchard replant, both to newer varieties and at higher density plantings.

Expected regional benefits of extending the orchard replant program have been identified in the following areas. Many of these benefits might be at risk without the Orchard Replant Program and concurrent revitalization initiatives.

- Direct cash flow contribution to local economy
- Contribution to regional employment
- Attraction of new investment to the region
- General support to regional tourism and development of the Agri-tourism sector
- Health, Safety and Environmental Benefits

These areas are reported on in this section. Given the short time frame of this project, prediction of regional and provincial benefits accruing from extension of the replant program have essentially been derived from a review of benefits resulting from the current replant program and considering their implications for the future. Almost no work previous to this report has been carried out on this issue. Important indications of where the regional benefits are likely to be found were identified as a result of document review and interviews carried out for this project with regional representatives of the sector and other related sectors. However, statistical data on several of the more interesting areas where the replant program appears to be playing an important role have not been collected to date. Based on the initial findings reported here, this issue is one that requires further systematic investigation.

9.1 Direct cash flow contribution to local economy

Current situation

- In 1994 it was estimated that tree fruit sales generate \$258 million in revenue annually.⁹¹
- It was also estimated that replanting will result in an increase in current industry farm gate revenues of \$50 million in 1995 to an estimated \$77 million by the end of the decade. When all of the replanted acreage comes into production, it was estimated that industry farm gate revenues would reach \$85 million, representing an increase of over 90%.⁹² However, in the Ministry of Agriculture and Food's Report on the Financial Position of the Okanagan Tree Fruit Industry in 1999, the latest report available, it was reported that fruit revenues for 1997 reached over \$96 million⁹³, surpassing the 1994 five-year estimate by \$19 million. The industry also contributed over \$7 million in income and corporate taxes in 1994 alone.

⁹¹ ARA, SIR Program review.

⁹² OVTFA brochure, 1995.

⁹³ MAF, Financial Position of the Okanagan Tree Fruit Industry, July 1999.

- Over its program life nearly \$7 million will be spent each year on goods and services to support the extended replant acreage.⁹⁴
- Nearly \$120 million is spent each year on goods and services to support the industry⁹⁵

Implications for the future

- Farm level revenues increased from \$67.2 million to \$96 million from 1994 to 1997, an increase of \$9.6 million per year. As yields from higher density plantings come into production we can expect continuation of this trend if higher prices are gained as predicted for the newer varieties being produced. In a firm economy the \$25 million extension of the OVTFA Replant Program can be expected to further develop this trend and lead to an increase in the \$258 million annual revenues from tree fruit sales achieved in 1994.⁹⁶ Industry contributions to the tax base can also be expected to rise accordingly.

9.2 Contribution to regional employment

Current situation

- In 1994, the industry supported approximately 3,000 full-time jobs for British Columbians who earn over \$60 million annually in wages and salaries.⁹⁷
- It is estimated that the tree fruit industry and other related industries may benefit as many as 7,500 people including marketing industries and processors, packinghouses, Sun Rype, irrigation suppliers, equipment suppliers, the SIR program, fertilizer suppliers and others.⁹⁸

Expected benefits from replant extension

- Investment in replant maintains present jobs and, in a firm economy, can be expected to create additional jobs related to the tree fruit industry in packing, processing, marketing, nursery, transportation, technical specialist fields and related. Farm suppliers will benefit directly. Jobs in the service industry, such as those associated with motels and hotels, are expected to increase as well.⁹⁹

9.3 New investment in the region

Experience to date

- It was estimated that growers would invest \$50 million in replant projects over the current mandate of the OVTFA. This figure was to be matched by an additional \$21 million by the OVTFA for a total of \$71 million. Existing studies have estimated that replant costs are in the range of \$10,000 per acre to 23,000 /acre for apples.^{100,101,102} Using an average replant cost of \$15,000/acre^{103,104,105} and an average grant/acre of \$4000, it is estimated that growers have

⁹⁴ MAF, Planning for Profit, Gala Apples, 1999.

⁹⁵ ARA, SIR program Review, 1995.

⁹⁶ OVTFA Brochure, 1995.

⁹⁷ ARA, SIR program Review, 1995.

⁹⁸ Gambell P. Past Director, OVFTA, pers. comm.

⁹⁹ Gambell P. Past Director, OVFTA, pers. comm.

¹⁰⁰ MAF, Financial Position of the Okanagan Tree Fruit Industry, July 1999.

¹⁰¹ MAF, Planning for Profit, Gala Apples, 1999.

¹⁰² OVTFA, Ross Husdon letter, April 1999.

¹⁰³ John Fredette, Farm Credit Corporation, pers. comm.

¹⁰⁴ MAF, Planning for Profit, Gala Apples, 1999.

invested over \$57 million to replant 5,190 acres over the nine-year life of the OVTFA Replant Program.

- The federal and provincial governments have contributed over \$22 million to extend the SIR program through the entire Okanagan-Kootenay fruit-growing region. The SIR board provides most program funding through a general mill rate levy, and a parcel tax on apple and pear acreage. These federal and provincial funds, along with the locally raised funding, ensure that the program's costs will be covered through the year 2005.
- At the present time the Pacific Agri-Food Research Centre at Summerland brings and additional \$8 million federal dollars to the Okanagan region annually. Of this amount a ballpark estimate of \$3 - 3.5 million directly related to tree fruit projects was budgeted in 1999.^{106 107}
- The move toward a more competitive, market-driven tree fruit industry has stimulated research into new varieties and this has led to new products. Research into related technologies, such as SIR has also made advances. New businesses with the potential to export these, and related, technologies are reported.^{108,109} In the early 1990's, for example, the British Columbia Fruit Growers' Association recognized the potential economic benefits of a Canadian company dedicated solely to commercial development of new varieties of fruit. The Okanagan Plant Improvement Company, PICO, was established in 1993 with a mandate to help move these new varieties from the orchard to the market-place. Working under an exclusive contract with the Government of Canada's world-renowned Summerland Research Centre, PICO is responsible for testing and developing new types of fruit such as apples, pears, peaches, and cherries. Today these new varieties are being marketed throughout Canada and around the world, providing increasing returns to the company and its grower shareholders.¹¹⁰

Implications for the future

- Using an average replant cost of \$15,000/acre^{111,112,113} and an average grant/acre of \$4000, growers will invest over \$55 million to replant 5000 acres over the next five years.
- The extended program can be expected to attract continuing provincial and federal support for the SIR program and the Pacific Agri-Food Research Centre.
- As a part of this momentum there is now a focus on attracting larger corporate entities interested in developing destination theme resorts built around the topic of farming, to the region.¹¹⁴
- The move toward a more competitive, market-driven tree fruit industry has stimulated research in new varieties and this has led to new products. Research into related technologies, such as SIR has also made advances in this atmosphere. New businesses with the potential to export these, and related, technologies are reportedly being considered.^{115,116} The SIR program's reduction in codling moth provides a good example. In recent years at least 60% of the total tree fruit acreage didn't need to be sprayed. In combination with other technologies such as mating disruption the

¹⁰⁵ MAF, Financial Position of the Okanagan Tree Fruit Industry, July 1999.

¹⁰⁶ Agriculture and Agri-Food Canada, News Release, December 1997.

¹⁰⁷ PARC, pers. comm.

¹⁰⁸ Robert Fine, Kelowna Economic Development Commission, pers. comm.

¹⁰⁹ Elise Petersen, SIR Program, pers. comm.

¹¹⁰ <http://res.agr.ca/summer/scrfrm.htm>

¹¹¹ John Fredette, Farm Credit Corporation, pers. comm.

¹¹² MAF, Planning for Profit, Gala Apples, 1999.

¹¹³ MAF, Financial Position of the Okanagan Tree Fruit Industry, July 1999.

¹¹⁴ Robert Fine, Kelowna Economic Development Commission, pers. comm.

¹¹⁵ ibid

¹¹⁶ Elise Petersen, SIR Program, pers. comm.

technologies associated with the SIR Program may be exportable with present interest coming from Syria, South Africa and Washington State.^{117 118}

9.4 General support to regional tourism and development of the Agri-tourism sector

Experience to date

- The revitalized tree fruit industry in the Okanagan region supports the tourism industry. Tree fruit visuals are "part of the sell" and help define in a positive way how the Okanagan differs from other locations as a destination.¹¹⁹ The orchards are an important "hook" that tourist operators use to bring people to the Okanagan. Many tourists feel that Okanagan and fruit are really one word because the region has the allure of the fruit trees and the scenic backdrop that the orchards provides.¹²⁰ The Okanagan is recognized for its quality of life and the tree fruit industry contributes to this image both with its "visuals" and the move toward biological controls and limited use of pesticides. These factors lend themselves to tourism development.¹²¹
- Agri-tourism is a rapidly growing industry in the Okanagan region at least partly due to the advent of higher density plantings of smaller trees.¹²² The smaller trees enable growers to more easily demonstrate the skills they utilize to produce quality fruits and allows tourists the "hands-on" experience of picking.¹²³ The reduced pesticide use associated with higher density orchards also lessens the risk of having visitors in the orchards and makes orchards more attractive to tourists.^{124,125,126}
- A variety of farmers in the Okanagan region are demonstrating that agri-tourism can be good for the bottom line. Agri-tourism and other multi-purpose activities are probably not utilized as fully as they could be.¹²⁷ Farmers can add value by bringing tourists onto the farm to educate them. Some orchards are becoming very successful in tying tourism with agriculture.¹²⁸ There are now several examples of expanding shops, tour bus parking and local gift shops related to the orchard industry. Tourism associations routinely field requests from tour operators for u-pick orchards.¹²⁹ In response, some growers are replanting to softer varieties to ensure a longer season.¹²⁹

Implications for the future

- Tourism can be expected to continue to expand and agri-tourism can be expected to grow throughout the Okanagan region, as more operators become aware of the potential benefits for farm gate revenues. There is, reportedly, particular potential in the southern part of the Okanagan Valley where opportunities associated with agri-tourism has not yet been fully realized.¹³⁰ As a part of this momentum toward using agriculture as a drawing card for tourists there is now a

¹¹⁷ Hugh Philip, MAF, pers. comm.

¹¹⁸ Adrian McCluskey, SIR, pers. comm.

¹¹⁹ Linda Trudeau, Thompson Okanagan Tourism Association, pers. comm.

¹²⁰ *ibid*

¹²¹ Robert Fine, Kelowna Economic Development Commission, pers. comm.

¹²² Linda Trudeau, Thompson Okanagan Tourism Association, pers. comm.

¹²³ *ibid*

¹²⁴ *ibid*

¹²⁵ Robert Fine, Kelowna Economic Development Commission, pers. comm.

¹²⁶ Hugh Philip, MAF, pers. comm.

¹²⁷ *ibid*

¹²⁸ Robert Fine, Kelowna Economic Development Commission, pers. com.

¹²⁹ Linda Trudeau, Thompson Okanagan Tourism Association, pers. com.

¹³⁰ *ibid*

focus on attracting larger corporate entities interested in developing destination theme resorts built around the theme of farming.¹³¹

9.5 Health, Safety and Environmental Benefits

Experience to date

- High density plantings lend themselves to minimizing use of harsh, more toxic chemicals in favour of softer products, allowing natural biologicals to occur. The smaller trees are easier to evaluate, inspect and manage and allow more efficient use of controls. Tree fruits lend them to biological systems because of permanence. Pesticide volumes can be reduced at least 25-50% over traditional plantings and technologies to recapture spray are now becoming available. This reduction can lead to substantial savings for growers and assumed environmental benefits.¹³²
- Anecdotal information implies that the health and safety of orchard workers has increased with the adoption of higher density plantings. The safety coordinator of the Farm and Ranch Safety and Health Association (FARSHA) notes that over 50% of the injuries in orchards come from falls from ladders or elevations. Accidents are definitely lower with the move to step stools in higher density plantings. FARSHA hopes for reduction of 20% decrease in falls from ladders and elevations and be careful of back injuries.¹³³

Implications for the future

- Trends toward increasing health, safety and environmental benefits can be expected to continue and expand, as growers become more familiar with high density systems over time. This will be a benefit to workers in the industry, tourists, and adjacent communities throughout the Okanagan. Quality of life will continue to improve and become an even more impressive drawing card for the region.

¹³¹ Robert Fine, Kelowna Economic Development Commission, pers. com.

¹³² *ibid*

¹³³ Sandeep Mangat, Farm and Ranch Safety and Health Association, pers. comm.

10. Considerations for Future Replant Programs

Based solely on the documents reviewed and interviews conducted for this report, the following considerations for future replant programs have been identified:

1. Unless the TPAP program and FCC Plant Now – Pay Later loan program is in place the majority of tree fruit operators will not be able to take advantage of a replant grant at its current value.¹³⁴
2. Leasing orchard lands or bare ground provides an important opportunity for farm expansion. Leasing of orchards may assist some growers to compensate for their own smaller holdings and build up to the most economically efficient unit size. Utilization of future replant programs to provide some opportunity for planting to leased bare ground would provide an important avenue for growers to increase the size of their farms.
 - In B.C. the middle acreage size orchards (15 -30 acres) have shown the best overall performance.
 - Size of farm may be an important consideration in terms of ability to cash flow replant programs.¹³⁵ Both Stennes¹³⁶ and Ellison¹³⁷ reported that the middle acreage size orchards (15 - 30 acres) in B.C. have shown the best performance, with a combination of market returns and safety nets and/or other farm income generally covering all costs. All income sources (fruit sales, safety net and other program payments, interest and other farm income) were generally needed by the other acreage groups to cover all costs.¹³⁸
 - Fixed costs on a 10 acre B.C. orchard are more than \$600 per acre higher than on a larger 50 acre B.C. orchard. Most of the cost differences are machinery and equipment costs.¹³⁹
 - Leasing of orchards, being encouraged by the OVTFA, may assist some growers to compensate for their own smaller holdings.¹⁴⁰
3. Since successful replanting programs are dependent on planting marketable varieties, an important consideration to help ensure the widest possible success for future replant programs could be the development and implementation of an overall industry plan to assess new variety introduction and to pass that information on to growers for their consideration. Such a plan would ensure that appropriate numbers of apple and other fruit trees having the required cultivator-rootstock combination were propagated over particular spans of time and make certain that nurseries had the lead time they require to respond to grower demands.
 - The Tree Fruit Consultation Forum¹⁴¹ reported that there could be possible advantages of higher densities and inclusion of higher-valued varieties in the production mix. Varieties grown and quality achieved could have a major impact on net returns through improving the average price received in the market.

¹³⁴ Lohr, W. (1999). Financial position of the Okanagan Tree Fruit Industry. Report to the BC Ministry of Agriculture and Food.

¹³⁵ Jim Campbell, MAF, pers. comm.

¹³⁶ The Economics of Apple Production at the Farm-Level in British Columbia and Washington State, September 1994.

¹³⁷ Financial Data Survey, Okanagan Valley Tree Fruit Producers, January 1995.

¹³⁸ ibid

¹³⁹ ibid

¹⁴⁰ ibid

¹⁴¹ Tree Fruit Consultation Forum, Assessment of the British Columbia Tree Fruit Sector, 1995.

- Returns are affected by variety mix and orchard density, through price, yields and costs. For Red Delicious apples, higher densities provide higher gross returns and higher returns over variable costs, than do lower densities.¹⁴²
- 4. Technology transfer, horticultural training and continuing improvement of business management skills are very important if growers are to achieve the full production potential of high density plantings. A new replant program may consider Lusztig's call for some program criteria related to requiring evidence of producers having the necessary skills or undertaking steps to obtain them in order to qualify for a replant grant.
 - In 1990 the Report of the Commission of Inquiry stated "Growers possessing the necessary horticultural and business management skills and in a position to work orchards of reasonable size, should be strongly encouraged to adopt higher density plantings that are diversified in terms of varieties."¹⁴³
 - The Commission of Inquiry suggested the completion of a set of appropriate extension courses, including those with a business management focus offered by the Ministry of Agriculture and Food, or a course of studies taken at a college, a university degree in agriculture, or some reasonable equivalent as the basis for establishing grower competence.¹⁴⁴
 - Enhanced horticultural management and education assistance is needed to ensure success in high density management. Some growers do extremely well while others are not as successful. Steps need to be taken to assist growers and their advisors to improve their replant knowledge because improved grower skills will help increase the success of replant projects.¹⁴⁵
 - Managing a replanted high density orchard is a learning process. Growers need to develop a thorough strategic plan and cultivate the ability to respond quickly to changing conditions in order to reduce risk. Good horticultural skills are critical for bringing high density plantings into early production.¹⁴⁶

¹⁴² Stennes, 1994.

¹⁴³ Report of the Commission of Inquiry - British Columbia Tree Fruit Industry, May 1990.

¹⁴⁴ ibid

¹⁴⁵ ibid

¹⁴⁶ Jim Campbell, MAF, pers. comm.

11. Future research

In the course of preparing this report two important areas were noted that would benefit the tree fruit sector if further research could be carried out in them. These areas are:

- Further research into the key factors used by producers in their selection of tree fruits and varieties for replanting
- Further research into the socio-economic benefits accruing to the region and province as a result of the replant program. The work carried out for this report identified key areas in which to pursue further investigation and identified a range of key informants who would be in a position to further develop this area given more time and resources.

Appendix I Tree Fruit Variety Selection method Survey

The Ministry of Agriculture and Food is consulting with the tree fruit industry on the future of the replant program. As part of its work to provide required background information for all stakeholders, the Ministry needs to identify how producers currently decide on variety selection for an orchard replant. Your opinion on the selection process is requested. Your prompt response to this short questionnaire (which takes about 5 minutes to complete) will provide valuable input into the upcoming discussions. Your responses will remain anonymous in any reporting of the data. The consulting firm Universalia, has been requested by the Ministry to assist in this task.

Please check off your responses to the following two questions and fax all three sheets back by **Monday, November 8, 1999**. Fax the sheets to Kelleen Wiseman P.Ag. at (604) 733-8915. If you have any questions please call at (604) 733 8914. Thank you for your help.

1. Factors considered in variety and tree fruit selection

Tree fruit producers currently consider a number of factors when selecting a variety or tree fruit for their orchard. Based on your own experience and knowledge, please check off one box below to indicate the level of consideration that you as a producer will typically give to each of following factors when selecting a variety:

	Always consider	Sometimes consider	Never consider	Do not know	Not applicable
1.1 Climatic factors (e.g., frost free days, winter temperature)	<input type="checkbox"/>				
1.2 What variety or tree fruit other producers in the area are growing	<input type="checkbox"/>				
1.3 Compatibility with level of production management skills	<input type="checkbox"/>				
1.4 Growth characteristics of the specific variety or tree fruit (e.g., pollen viability, bloom timing & vigor, timing of harvest, ease of establishment, years to full production)	<input type="checkbox"/>				
1.5 Site/orchard location (e.g., soil, slope, drainage)	<input type="checkbox"/>				
1.6 Personal experience with similar tree fruit or variety	<input type="checkbox"/>				

	Always consider	Sometimes consider	Never consider	Do not know	Not applicable
1.7 Market considerations (e.g., Consumer demand for variety, market acceptability, demand and supply information)	<input type="checkbox"/>				
1.8 Experience with production system (e.g., Slender spindle, central axis)	<input type="checkbox"/>				
1.9 Post harvest factors (e.g., Storage, handling ease, quality of final product, storage scald)	<input type="checkbox"/>				
1.10 Historical prices (e.g., Return to growers' in the last 2 to 4 years)	<input type="checkbox"/>				
1.11 Future price potential	<input type="checkbox"/>				
1.12 Cost & patent charge of fruit trees	<input type="checkbox"/>				
1.13 Disease resistance characteristics (e.g., SIR program)	<input type="checkbox"/>				
1.14 Government programs (e.g. OVTFA replant program, WFIP, NISA, Crop Insurance, FCC)	<input type="checkbox"/>				
1.15 Current mix of varieties in orchard	<input type="checkbox"/>				
1.16 Fruit tree & budwood availability	<input type="checkbox"/>				
1.17 Recommendation from tree fruit research facilities	<input type="checkbox"/>				
1.18 Rate of return per acre	<input type="checkbox"/>				
1.19 Packing house recommendations	<input type="checkbox"/>				
1.20 Technical advice available	<input type="checkbox"/>				
1.21 Number of years to commercial production	<input type="checkbox"/>				
1.22 Other (please describe below)	<input type="checkbox"/>				

2. The most commonly used factors

Using the list of factors in Question 1, please select the 5 top factors you as a producer consider when selecting a variety or tree fruit for your orchard. Write the number beside the factor listed in Question 1, ranking your selection from the top factor considered (enter a 1 beside the selected factor) to the lowest factor considered (enter a 5 beside the factor).

3. Any other comments on the variety or tree fruit selection process

Please note below any comments you may have concerning producer selection of varieties.

*Please fax your completed survey to Kelleen Wiseman, P.Ag. at (604) 733 8915 by
Thursday November 4, 1999.*

Please call at (604) 733-8914 with any questions.

Thank you for your help.